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ARTICLE

LEVERAGING LOGICAL FORM IN LEGAL ARGUMENT: THE INHERENT AMBIGUITY IN LOGICAL DISJUNCTION AND ITS IMPLICATION IN LEGAL ARGUMENT

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I. INTRODUCTION: LOGIC'S QUIET, PERVASIVE ROLE IN ADVOCACY

Trial lawyers love to design carefully constructed arguments. However, they do not always consider some of the most important details of persuasive advocacy—the logical structure of their arguments.[1] While lawyers are well aware of their obligations to master and marshal the *law* and the *facts* in support of a client's claim, they are generally not so intentional about mastering and marshaling the internal *logic* of the pleadings they design, briefs they write, or contracts and statutes they read or draft. In fact, many lawyers are surprised to learn that—in addition to the rules of law—there are rules of logic that ensure and test the integrity of legal argument.[2] It is important to note that these rules of

logic, discussed and refined by philosophers for more than 2,000 years, have important, useful, and pervasive application to the practice of law.[3]

In 1915, during "the heyday of legal formalism,"[4] if a lawyer or jurist had the benefit of a searchable electronic database of case law, then that lawyer might have been disappointed in the search results for the most formalistic terms of legal reasoning (i.e., the language of formal philosophical logic). A present-day search of state and federal cases prior to 1916 yields only eleven results containing such formalistic terms, and all the results are for the general terms *formal logic* or *logical fallacy*.[5] According to these results, no cases discussing a particular pattern of valid or invalid formal logic in legal argument can be found prior to 1916.[6]

Arguably, the next century (1915–2015) does not represent a fair comparison to the previous period. Courts authored substantially more cases in the last century, and electronic databases reflect this reality. However, it is worth noting that a review of references to concepts of formal philosophical logic in the last century reveals not only *more*

Fallacy of Denying the Antecedent as a Litigation Tool, 79 MISS. L.J. 609 (2010) [hereinafter Rice, *Conventional Logic*]; Stephen M. Rice, *False Persuasion, Superficial Heuristics, and the Power of Logical Form to Test the Integrity of Legal Argument*, 34 PACE L. REV. 76 (2014) [hereinafter Rice, *Integrity of Legal Argument*]; Stephen M. Rice, *Indiscernible Logic: Using the Logical Fallacies of the Illicit Major Term and the Illicit Minor Term as Litigation Tools*, 47 WILLAMETTE L. REV. 101 (2010) [hereinafter Rice, *Indiscernible Logic*]; Stephen M. Rice, *Indispensable Logic: Using the Logical Fallacy of the Undistributed Middle as a Litigation Tool*, 43 AKRON L. REV. 79 (2010) [hereinafter Rice, *Indispensable Logic*].

    3. Rice, *Conventional Logic*, *supra* note 2, at 674–75.
    4. BRIAN Z. TAMANAHA, BEYOND THE FORMALIST-REALIST DIVIDE 1–9 (2010). There has been substantial scholarly discussion related to the traditional formalist–realist narrative, including some challenges to the historical accuracy of the narrative altogether. *Id.* at 3–5. The period "[f]rom the 1870s through the 1920s" was "the heyday of legal formalism" when, as the story goes, "lawyers and judges saw law as autonomous, comprehensive, logically ordered, and determinate and believed that judges engaged in pure mechanical deduction from [a] body of law to produce single correct outcomes." *Id.* at 1. Professor Tamanaha challenges this traditional "false story" about formalism and the traditional–realist narrative, and he presents an argument for "balanced realism." *Id.* at 4, 6.
    5. A Westlaw search dated February 16, 2015, for cases authored prior to January 1, 1916, produced these results using the following terms: *logical fallacy*, *denying the antecedent*, *affirming the consequent*, *affirming a disjunct*, *existential fallacy*, *illicit process*, *illicit negative*, *illicit major*, *illicit minor*, *exclusive premises*, *fallacy of four terms*, *illicit affirmative*, *formal logic*, *undistributed middle*, and *negative premise*. The author does not suggest that this simple search represents a sufficient empirical basis to reach any reliable conclusions regarding statistical references to terms of formal logic.
    6. *See supra* note 5.

references to formal logic (1,147) but also more *specific* references.[7] This pattern is not significant enough to support broad conclusions about the place of formalism or formal logic in contemporary legal reasoning. However, it does provide a useful sample of cases for exploring the role and persuasive force of formal logic in jurisprudence and for studying how courts use the rules and language of logical form to solve legal problems.

This Article explores the role of ancient rules of formal logic in the contemporary context of legal argument by using one of the most simple and powerful devices of formal logic—the logical concept of disjunction, represented by the English word *or*. The Article begins by describing what is meant by *formal logic* and explaining why formal logic plays an essential role in legal argument. Next, the Article introduces the three practical implications of the logical force of *or*: (1) its inherent ambiguity; (2) its place in understanding logically fallacious arguments; and (3) the frequent coexistence of negation and disjunction in legal argument. That introduction is followed by a review of case law that illustrates how, quite recently, judges have explicitly considered the nature of disjunction, utilizing rules of formal logic to evaluate legal argument. The Article concludes by arguing that even a limited understanding of the philosophy of formal logic provides substantial practical advantages to lawyers and judges who necessarily confront problems in logic on a regular basis in the course of solving problems in law.

While the place of formal logic in American jurisprudence is a topic more appropriately and completely addressed elsewhere, this Article begins with a frequently undiscussed and largely uncontroversial premise: Formal logic (the philosophical study and rules of deductive argument) has some place in legal reasoning and argument.[8] Furthermore, an argument that is necessarily illogical is not a persuasive device for justifying a conclusion. It has been said that "the rôle of deduction is not an accidental incident in law and natural science but is rather an essential part of their life."[9] However, "[t]he law, of course, never succeeds in becoming a completely deductive system. It does not

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7.   *See id.* For a collection and discussion of cases that reference specific formal logical fallacies, see *infra* notes 51–57.

8.   *See* discussion *infra* Section II.C (describing *formal logic* and analyzing formal logic's place within legal argument).

9.   Morris R. Cohen, *The Place of Logic in the Law*, 29 Harv. L. Rev. 622, 627 (1916).

even succeed in becoming completely consistent. But the effort to assume the form of a deductive system underlies all constructive legal scholarship."[10] Valid logical form, at the very least, provides a foundation for legal argument.[11] Put otherwise, while legal argument is different from traditional formal logic at times, legal argument that is logically fallacious—meaning that there is an illogical and unreliable relationship between the premise of the argument and its conclusion—must be discarded for another argument that is, at least, logically coherent.[12]

In legal reasoning, deduction has a role that provides a structure by which judges reason from general principles of law to particulars.[13] Furthermore, logically invalid patterns of reasoning are not persuasive, and those evaluating them will readily reject such a pattern. The court might embrace the argument's conclusion and might be swayed by an arguer's credibility, an arguer's passion, or some other valid argument supporting the conclusion; however, the court will not find a necessarily illogical argument itself persuasive. Pursuing a closer understanding of logical form in legal argument can provide practical advantages to

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10. *Id.* at 624.

11. *See* ANTONIN SCALIA & BRYAN A. GARNER, MAKING YOUR CASE: THE ART OF PERSUADING JUDGES 42 (2008).

> Legal argument generally has three sources of major premises: a text (constitution, statute, regulation, ordinance, or contract), precedent (caselaw, etc.), and policy (i.e., consequences of the decision). Often the major premise is self-evident and acknowledged by both sides.
>
> The minor premise, meanwhile, is derived from the facts of the case. There is much to be said for the proposition that "legal reasoning revolves mainly around the establishment of the minor premise."

Id. (quoting O. C. JENSEN, THE NATURE OF LEGAL ARGUMENT 20 (1957)).

12. *See* KENNETH J. VANDEVELDE, THINKING LIKE A LAWYER: AN INTRODUCTION TO LEGAL REASONING 91 (2d ed. 2011).

> Application of [legal] rules requires the use of one of two methods: deduction or analogy. When using deduction, the lawyer determines whether the facts of the situation are or are not described by the factual predicate of a rule and thus whether the legal consequence imposed by the rule does or does not apply to the situation. When using analogy, the lawyer determines whether the facts of the situation are or are not like those described by the factual predicate of the rule and thus whether the legal consequence imposed by the rule does or does not apply to the situation. In applying either of these methods, the lawyer uses rules to determine the rights and duties that exist in the situation and thereby completes the legal reasoning process.

Id.

13. *See id.*

lawyers who regularly engage in making and evaluating legal argument. That closer understanding and such practical advantages begin with defining *formal logic* and recognizing the nature of its quiet, persuasive role in legal argument.

II. FORMAL LOGIC AND ITS ESSENTIAL ROLE IN LEGAL ARGUMENT

A. *Formal Logic Has an Essential Role to Play in Legal Argument*

Logical form plays an essential role in crafting and evaluating legal argument, and it finds its place at every level of the lawyering process. Logical form's place begins in law school, where students learn the law and the legal-reasoning process. Law students are frequently introduced to the logic of the law[14] in the form of acronyms like IRAC,[15] CREAC,[16] or CIRIP,[17] and a substantial portion of law school is spent studying the logical process that courts use in drawing inferences from general principles of law to particular facts.[18]

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14.   *See* Terrill Pollman, *Building a Tower of Babel or Building a Discipline? Talking About Legal Writing*, 85 MARQ. L. REV. 887, 898 & n.50 (2002); *see also* Susan E. Provenzano & Lesley S. Kagan, *Teaching in Reverse: A Positive Approach to Analytical Errors in 1L Writing*, 39 LOY. U. CHI. L.J. 123, 129–30 (2007) (describing IRAC as a "'positive' teaching tool[]" and recognizing that "[t]hrough positive teaching tools, 1Ls learn the many different ways that legal analysis can go right, but see fewer contrasting varieties of how their own legal analysis is likely to go wrong").

15.   *See* James Ottavio Castagnera, *Why the Nation Needs More Lawyers*, 22 T. MARSHALL L. REV. 19, 26 (1996) ("IRAC is to legal analysis what 'Force = Mass x Velocity' is to Newtonian physics."); *see also* J. Christopher Rideout & Jill J. Ramsfield, Dedication, *Legal Writing: A Revised View*, 69 WASH. L. REV. 35, 75 & n.136 (1994) ("This acronym stands for Issue, Rule, Application, and Conclusion, an oversimplified version of deductive reasoning useful in some legal writing contexts as an introduction, but not in others.").

16.   CREAC is an acronym representing five stages in legal writing and analysis. The letters in the acronym represent *conclusion*, *rule*, *elaboration*, *application*, and a restatement of the *conclusion*. BRYAN A. GARNER, GARNER ON LANGUAGE AND WRITING 403 (2009).

17.   CIRIP is an acronym representing five stages in legal writing and analysis. The letters in the acronym represent *conclusion*, *issue*, *rule* (or *principle*), *interweaving*, and *policy*. JOHN DELANEY, HOW TO DO YOUR BEST ON LAW SCHOOL EXAMS 118 (rev. ed. 1988).

18.   *See* Kathleen Magone & Steven I. Friedland, *The Paradox of Creative Legal Analysis: Venturing into the Wilderness*, 79 U. DET. MERCY L. REV. 571, 581 (2002) ("Analytical reasoning in law school is primarily deductive, involving the application of general principles to particular sets of facts, for the purpose of discovering the relationship between rules and particular circumstances."); *see also* Nichole Biglin, Note, *Enablement: For the Judge or the Jury? Markman v. Westview Instruments, Inc.'s*

Beyond law school, lawyers regularly answer questions like whether a statute applies to a particular set of business practices, whether a court rule regulates a particular pleading, or whether a court's ruling controls the outcome of a specific case. These fundamental matters require application of formal logic. Even more advanced lawyering skills—like designing a persuasive direct examination,[19] preparing a closing argument,[20] or writing a persuasive appellate brief[21]—require precise logical form in order for these rhetorical devices of legal argument to have a persuasive effect on their targets. The logical structure of argument can raise the science of legal analysis to the art of legal persuasion.[22] "Appellate briefs are beautiful precisely because of their precedent-based math and logic: It's the logic and precedent that persuade."[23]

Most lawyers would be happy to have their legal briefs, memoranda, pleadings, and arguments described as "beautiful."[24] What is it about the

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Analysis Applied, 52 DRAKE L. REV. 145, 146 (2003) ("Generally, a question of fact is one that involves a determination of whether certain acts or events actually occurred, or certain conditions existed, whereas a question of law applies general principles or rules to particular facts." (citing Philippe Signore, *On the Role of Juries in Patent Litigation (*Part 1*)*, 83 J. PAT. & TRADEMARK OFF. SOC'Y 791, 799 (2001))).

19. *See, e.g.*, Chris Gair, *Problem Witnesses: Coping with Character Attacks*, TRIAL, Sept. 1996, at 64, 68 ("Good direct examinations have an internal logic that the jury can follow, and the impeaching facts fit in a logical place.").

20. H. Mitchell Caldwell et al., *The Art and Architecture of Closing Argument*, 76 TUL. L. REV. 961, 996 (2002) ("The third key principle for effective closing arguments is a logical structure so that the jurors enter the deliberation room with a clear agenda and a memorable framework for decision making." (first citing GARY T. HUNT, EFFECTIVE COMMUNICATION 251 (1985); and then citing MICHAEL R. FONTHAM, TRIAL TECHNIQUE AND EVIDENCE § 9-3, at 464 (1995))); *see also* Jeffrey A. Peck & Jodi Sydell Rosenzweig, *Closing Argument*, N.J. LAW., Dec. 1998, at 38, 41 ("The hallmark of a closing argument is simplicity, logic, sincerity and persuasion. The goal, of course, is to lead the jury to the proper verdict.").

21. Brian K. Keller, *Whittling: Drafting Concise and Effective Appellate Briefs*, 14 J. APP. PRAC. & PROCESS 285, 292, 295–96 (2013) ("An appellate brief is an exercise in logic, and is at its core a logic proof. . . . Appellate advocacy is a process of logic proofs. Indeed, as Lord Coke put it, 'reason is the life of the law.'" (quoting 1 J. H. THOMAS, SYSTEMATIC ARRANGEMENT OF LORD COKE'S FIRST INSTITUTE OF THE LAWS OF ENGLAND 1 (Philadelphia, Alexander Towar, 2d Am. ed. 1836))); *see also* Jean H. Toal et al., *Four Steps to Effective Appellate Brief Writing*, S.C. LAW., May–June 1999, at 36, 37 ("Like any other form of writing, the appellate brief is effective when characterized by logic, clarity and simplicity. It is ineffective when marked by disorganization, obfuscation and complexity.").

22. *See* Keller, *supra* note 21, at 290–91.

23. *Id.*

24. *Id.*; *see also* JAMES MILL, *Jurisprudence*, *in* ESSAYS ON GOVERNMENT,

logic of legal argument, done well, that makes it not merely sound but also persuasive—even "beautiful"? Conversely, what is it in a legal argument's logical structure that makes it unsound, unpersuasive, and unattractive? The answer to these questions begins with understanding what logical form is and what role logical form plays in legal argument. However, many lawyers know relatively little about formal logic.[25] That is not to say these lawyers are illogical. Lawyers find logic intuitive.[26] Lawyers utilize logic effectively. Lawyers have been crafting succinct, persuasive, and logically coherent arguments for decades.[27] Nonetheless, for many lawyers, "[w]hat they know of logic is little more than [a] name."[28]

B. Lawyers Already Use Logic, Regardless of Whether They Think or Write About It Explicitly

Lawyers know quite a lot about how to use logic; however, when lawyers are asked to dissect an argument's logical architecture[29] or to describe what is good or bad about an argument's logical form, they will often struggle to offer more than accurate—but conclusory—responses. That should not surprise anyone since formal logic, like the law, has its own nomenclature and philosophies, which are not a part of the standard law school curriculum.[30]

JURISPRUDENCE, LIBERTY OF THE PRESS, AND LAW OF NATIONS 29 (J. Innes ed., 1828), *reprinted in* JAMES MILL, *Jurisprudence*, *in* POLITICAL WRITINGS 78 (Terence Ball ed., 1992) ("This mischievous mess, which exists in defiance and mockery of reason, English lawyers inform us, is a strict, and pure, and beautiful exemplification of the rules of logic.").

25. *See* MILL, *supra* note 24 ("All that [lawyers] see in the system of pleading is the mode of performing it.").

26. *See id.*

27. *See id.*

28. *Id.*

29. One description for formal logic is the "architecture of argument." *See generally* James C. Raymond, *The Architecture of Argument*, 7 JUD. REV.: J. JUD. COMMISSION N.S.W. 39 (2004).

30. Rice, *Conventional Logic*, *supra* note 2, at 675; *see also* James M. Boland, *Legal Writing Programs and Professionalism: Legal Writing Professors Can Join the Academic Club*, 18 ST. THOMAS L. REV. 711, 716–18 (2006).

> Traditionally, "all legal argument [has been] in the form of [a] syllogism[]," but legal writing text books and legal writing programs either neglect or completely ignore the syllogism, not recognizing that it is the best vehicle through which to base legal analysis pedagogy, and that it can become a sword for legal writing professors to penetrate the all-to-often closed world of tenured professorship.

Many lawyers find themselves in a place analogous to an owner of a new high-performance automobile. The owner may know a lot or a little about driving the automobile. If the driver has driven multiple times in different kinds of automobiles and in different road and weather conditions, the driver will still have varying levels of knowledge about the automobile and varying driving abilities. A highly experienced driver may be very good at driving the automobile. This is especially so with an automobile that is well engineered and designed to perform at a high level. An experienced, skilled driver can master the automobile's performance and make the most of the automobile's ability to accelerate, stop, and turn. However, if the automobile malfunctions, the driver—unless he or she has some experience designing or repairing automobiles—will struggle to describe the mechanical or electronic malfunctions that are causing the automobile to perform imperfectly. The driver might not even know the names of the engine or suspension components necessary to accurately describe what is wrong with the automobile, much less what terminology to use to detail or fix the problem.

We would not be surprised if a very good driver was in such a predicament. We respect the driver's skills; despite the driver's limited knowledge of camber plates and supercharger pulleys, we might not want to challenge the driver to a race. The driver has, however, been trained to drive automobiles, not to fix them. So a challenger with an understanding of engine defects might have a distinct advantage. Similarly, we would not say lawyers are bad lawyers because they do not know what a fallacy of distribution is in their arguments—as long as they can conclude that there is something wrong with their argument.[31]

Id. at 716–17 (alterations in original) (footnote omitted) (quoting JAMES A. GARDNER, LEGAL ARGUMENT: THE STRUCTURE AND LANGUAGE OF EFFECTIVE ADVOCACY § 1.1, at 3 (1993)).

  31. In logic, when a term is used in a way that "refers to all [of the] members of the class [referenced] by that term," that term is said to be *distributed*. IRVING M. COPI & CARL COHEN, INTRODUCTION TO LOGIC 245 (13th ed. 2009) (emphasis omitted); *see also* NICHOLAS BUNNIN & JIYUAN YU, THE BLACKWELL DICTIONARY OF WESTERN PHILOSOPHY 188 (2004) ("A term is distributed if it refers to all members of the class to which it is referring and is explicitly or implicitly prefixed by a universal quantifier." (emphasis omitted)); CHRISTOPHER W. TINDALE, FALLACIES AND ARGUMENT APPRAISAL 45 (2007) ("A term is said to be 'distributed' in a proposition when it is meant to refer to all members of the class of things that proposition denotes."); RICHARD WHATELY, ELEMENTS OF LOGIC 70 (New York, Harper & Bros., Am. ed. 1858) ("[A] term is said to be 'distributed,' when it is taken universally, so as to stand for everything it is capable of being applied to . . . ." (footnote omitted)); JAMES A. WINANS & WILLIAM E. UTTERBACK,

Lawyers frequently discard illogical arguments because, like the driver of the malfunctioning automobile, they know something is wrong but cannot describe the problem with precision. Many lawyers have expert knowledge regarding legal argument and the ability to skillfully utilize it, but they take for granted the fundamental logical form that lies "under the hood"; if there is a problem with that form, they cannot describe the logical problem. We might not be willing to say that "[w]hat they know of logic is little more than [a] name,"[32] but lawyers would likely agree that they struggle to describe the following: (1) precisely what good logic is; (2) when an argument's logical form is good or bad; and (3) what role the philosophy of formal logic has in legal argument.

C. Lawyers Can Make Better Use of Formal Logic and Should Apply It to Make and Evaluate Arguments More Effectively

Accordingly, learning something about formal logic can help a lawyer identify and explain what is wrong with certain arguments.[33] Understanding formal logic and its role in legal argument begins with exploring what is meant by the term *formal logic*.[34] Formal logic has been called the "philosophical study of proper inference."[35]

In argument generally, and in legal argument specifically, one party

ARGUMENTATION 69 (1930) ("A term is said to be distributed if it refers to a class of things in its entirety."). Conversely, if a term only refers to a portion of the members of the class, it is "undistributed." WHATELY, *supra* ("[A] term is said to be . . . 'undistributed,' when it stands for a portion only of the things signified by it . . . ."). Arguments that do not adhere to logical rules relating to distribution are said to be fallacious and unreliable. *See* COPI & COHEN, *supra*, at 244–49 (discussing syllogistic fallacies and the syllogistic rules of proper logical form).

32. MILL, *supra* note 24.

33. Rice, *Conventional Logic*, *supra* note 2, at 670–71.

34. Again, one description for formal logic is the "architecture of argument." *See generally* Raymond, *supra* note 29. Philosophers define logic in various ways, debate what logic is, and describe what makes logic "formal" or "informal." For example, it has been said that "[l]ogic, in its most extensive sense in which it has been thought advisable to employ the name, may be considered as the Science, and also as the Art, of Reasoning." WHATELY, *supra* note 31, at 1; *see also* J. LACY O'BYRNE CROKE, LOGIC § 2, at 3 (1906) ("Pure or Formal Logic is the science of the necessary laws of thought. It has *thought* rather than *language* for its adequate object-matter; for though it must express itself in language, and is very much concerned with it, language comes in only as the minister of thought. It is a *science*;—a science rather than an *art*.").

35. *See* PATRICK J. HURLEY, A CONCISE INTRODUCTION TO LOGIC § 1.3, at 31 (9th ed. 2006) ("A *deductive argument* is an argument in which the arguer claims that it is impossible for the conclusion to be false given that the premises are true." (emphasis omitted)); *see also* WILLIAM J. KILGORE, AN INTRODUCTORY LOGIC 509 (2d ed. 1979).

claims that his or her advocated conclusion is the proper inference to make from the law and the facts.[36] An *argument* is an effort to justify a conclusion based on inference.[37] While lawyers use various types of logical arguments,[38] they frequently employ deductive arguments in which a premise serves as the starting point for the argument.[39] The premise might be based on an undisputed fact, a legal presumption, or a clear legal rule.[40] From this premise, or from the relationship between two premises, the arguer seeks to reach a conclusion.[41] The conclusion is not accepted solely because the premises are true; rather, the conclusion is accepted because the premises are true *and* because the relationship between and among the premises and conclusion require that the conclusion be true.[42] Such an inference is proper only when the form of

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36. *See* COPI & COHEN, *supra* note 31, at 6–7.

37. *Id.* (defining *inference* and describing the relationship between an inference, an argument, and a conclusion).

> *Inference* is a process that may tie together a cluster of propositions. Some inferences are warranted (or correct); others are not. The logician analyzes these clusters, examining the propositions with which the process begins and with which it ends, as well as the relations among these propositions. Such a cluster of propositions constitutes an *argument*. Arguments are the chief concern of logic.

Id. at 6 (emphasis omitted).

38. *See* VANDEVELDE, *supra* note 12, at 127–28 (discussing both deductive and analogical reasoning in legal argument). However, the important role that analogical reasoning plays in legal argument is not unrelated to deductive, syllogistic argument:

> While analogies are thus useful in legal *reasoning,* they play a more limited role in legal *argument*. The obvious inadequacy of the use of analogy in constructing a legal argument is an analogy's inability to answer the question, "so what?" . . . It takes a syllogism to provide the answer to the "so what" challenge. That is, the logical force of an analogy comes from the syllogism to which it contributes, not from the persuasiveness of the analogy itself. Or, put another way, an analogy is a way of defending a premise of a syllogism; by itself, it is not an argument but merely a small piece of an argument.

GARDNER, *supra* note 30, § 1.5, at 11.

39. Deduction is not the only kind of legal argument. *See, e.g.*, VANDEVELDE, *supra* note 12.

40. *See* Rice, *Conventional Logic*, *supra* note 2, at 677.

41. *See* COPI & COHEN, *supra* note 31, at 7.

42. *See* JEROME E. BICKENBACH & JACQUELINE M. DAVIES, GOOD REASONS FOR BETTER ARGUMENTS: AN INTRODUCTION TO THE SKILLS AND VALUES OF CRITICAL THINKING § 6.3, at 237 (1997) ("When an argument is valid, if its premises are true then its conclusion must (necessarily) be true."); TRUDY GOVIER, A PRACTICAL STUDY OF ARGUMENT 108 (enhanced 7th ed. 2014) ("In formal logic, a *sound argument* is one in which all the premises are true and they provide logically conclusive support for the conclusion because they deductively entail it." (emphasis omitted)); HURLEY, *supra* note

the argument comports with simple rules of formal logic.[43] Deductive argument arranges the premises and conclusion into a syllogism—a common, persuasive form of argument[44] comprised of two premises and one conclusion.[45] *Formal logic*, then, is the study of the logical relationship of premises to conclusion.[46]

D. Logic's Persuasive Potential Depends on the Logical Form of the Argument It Supports

The logically persuasive value of a syllogistic argument depends on its compliance with a series of simple rules[47]—the rules of formal logic.[48]

35, § 1.4, at 43 (noting that "validity is something that is determined by the *relationship* between premises and conclusion" and further noting that "[t]he question is not whether [the] premises and conclusion are true [and] false, but whether the premises *support* the conclusion").

43.   *See, e.g.*, COPI & COHEN, *supra* note 31, at 244–49. For a description of the rules of logic, see *infra* note 48.

44.   SCALIA & GARNER, *supra* note 11, at 41. Justice Antonin Scalia and Bryan A. Garner have suggested that lawyers "[t]hink syllogistically" and observe that "[t]he most rigorous form of logic, and hence the most persuasive, is the syllogism"—the basic form of formal logical analysis. *Id.*; *see also* J.S. COVINGTON, JR., THE STRUCTURE OF LEGAL ARGUMENT AND PROOF 199 (2d ed. 2006) ("The enticing thing about the syllogism is that it yields a necessary conclusion, which means that if the listener accepts the premises, then the listener must accept the conclusions or contradict himself. The early European intellectual prized the power of the syllogism to the point that much of medieval university training was about intricate points in disputation based on the syllogism."); GARDNER, *supra* note 30, § 1.4, at 8 ("The power of syllogistic argument leads to the only significant rule about crafting legal arguments: *every good legal argument is cast in the form of a syllogism*.").

45.   COPI & COHEN, *supra* note 31, at 224.

46.   *See* GOVIER, *supra* note 42, at 178.

> In formal logic, various forms of argument are tested for their logical validity. The logically relevant features of the structure of an argument are represented by formalizing it. Then the formal version is tested. If it passes the tests thus imposed and the formal version has represented all the logically significant features of the original argument, that argument is formally valid.

Id.; *see also* RICHARD JEFFREY, FORMAL LOGIC: ITS SCOPE AND LIMITS 1 (3d ed. 1991) ("Formal logic is the science of deduction. It aims to provide systematic means for telling whether or not given conclusions follow from given premises, i.e., whether arguments are valid or invalid.").

47.   *See* COPI & COHEN, *supra* note 31, at 244.

48.   *See id.* For example, the rules of logic that apply to categorical syllogisms have been typically stated as follows: (1) "[a]void four terms" (a "categorical syllogism must contain exactly three terms," and the terms must have the same meaning each time they are used in the argument); (2) "[d]istribute the middle term in at least one premise"; (3) "[a]ny term distributed in the conclusion must be distributed in the premises";

When an argument violates any one of the rules of formal logic, it is said to be fallacious.[49] Logicians have given formal names to each type of fallacious argument; for example, if an argument in the form of a hypothetical syllogism[50] fails to comply with the rules of formal logic, it commits the Fallacy of Affirming the Consequent[51] or the Fallacy of Denying the Antecedent.[52] Two fallacious patterns of argument, the

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(4) "[a]void two negative premises"; (5) "[i]f either premise is negative, the conclusion must be negative"; and (6) "[f]rom two universal premises no particular conclusion may be drawn." *Id.* at 244–49. Other syllogistic forms, like the hypothetical syllogism, follow other simple rules. *Id.* at 301–02.

49. Rice, *Conventional Logic*, *supra* note 2, at 681.

50. COPI & COHEN, *supra* note 31, at 301–02. A hypothetical syllogism is made up of a conditional premise (an "if–then" proposition) and a categorical premise (a proposition that places its subject into a category). There are other types of syllogisms. One common syllogism used in legal argumentation is a categorical syllogism. In a categorical syllogism, the argument is based on the relationship between the concepts in the premises and the concepts' membership in certain categories. Another type of common syllogism is the disjunctive syllogism. The disjunctive syllogism "contain[s] a compound, disjunctive (or alternative) premise asserting the truth of at least one of two alternatives, and a premise that asserts the falsity of one of those alternatives." *Id.*

51. For a discussion related to the Fallacy of Affirming the Consequent and the concept's treatment in case law, see Rice, *Conspicuous Logic*, *supra* note 2. *See generally* Gilliam v. Nev. Power Co., 488 F.3d 1189, 1196 n.7 (9th Cir. 2007); Stewart Foods, Inc. v. Broecker (*In re* Stewart Foods, Inc.), 64 F.3d 141, 145 n.3 (4th Cir. 1995); United Tel. Co. of the Carolinas, Inc. v. FCC, 559 F.2d 720, 725–26 (D.C. Cir. 1977); Toussaint v. Good, No. 3:05-cv-443-KRG-KAP, 2008 WL 2994768, at *2 n.1 (W.D. Pa. Aug. 4, 2008), *aff'd per curiam*, 335 F. App'x 158 (3d Cir. 2009); Topliff v. Wal-Mart Stores E. LP, No. 6:04-CV-0297 (GHL), 2007 WL 911891, at *44 (N.D.N.Y. Mar. 22, 2007); Adams v. La.-Pac. Corp., 284 F. Supp. 2d 331, 338 & n.7 (W.D.N.C. 2003), *rev'd in part*, *vacated in part per curiam*, 177 F. App'x 335 (4th Cir. 2006); United States v. Carlson, 67 M.J. 693, 699 (N-M. Ct. Crim. App. 2009); United States v. Balcarczyk, 52 M.J. 809, 812 n.4 (N-M. Ct. Crim. App. 2000); *In re* Jeffery, No. H031673, 2008 WL 4358545, at *8 & n.8 (Cal. Ct. App. 2008); City of Green Ridge v. Kreisel, 25 S.W.3d 559, 563–64, 564 n.2 (Mo. Ct. App. 2000); Paulson v. State, 28 S.W.3d 570, 572 (Tex. Crim. App. 2000); Daniels v. Empty Eye, Inc., 368 S.W.3d 743, 752 (Tex. App. 2012); Culton v. State, 95 S.W.3d 401, 405 (Tex. App. 2002).

52. For a discussion related to the Fallacy of Denying the Antecedent—also known as the Fallacy of the Inverse—and the concept's treatment in case law, see Rice, *Conventional Logic*, *supra* note 2. *See generally* NLRB v. Noel Canning, 134 S. Ct. 2550, 2603 (2014) (Scalia, J., joined by Roberts, Thomas, and Alito, JJ., concurring); United States v. Davenport, 775 F.3d 605, 610 (3d Cir. 2015); Carver v. Lehman, 528 F.3d 659, 671 & n.1 (9th Cir.) (Smith, J., concurring), *withdrawn*, 540 F.3d 1011 (9th Cir. 2008); Arar v. Ashcroft, 585 F.3d 559, 600–01, 601 n.27 (2d Cir. 2009) (in banc) (Sack, J., joined by Calabresi, Pooler, and Parker, JJ., concurring in part and dissenting in part); Wilson v. Clark, 372 F. App'x 745, 747 (9th Cir. 2010); AGRI Processor Co. v. NLRB, 514 F.3d 1, 6 (D.C. Cir. 2008); E. Armata, Inc. v. Kor. Commercial Bank of N.Y., 367 F.3d 123, 131 & n.10 (2d Cir. 2004); Tobey v. United States, 794 F. Supp. 2d 594, 601 (D. Md. 2011) (citing TorPharm, Inc. v. Ranbaxy Pharms., Inc., 336 F.3d 1322,

Fallacies of Illicit Process[53] and the Fallacy of the Undistributed Middle Term,[54] take the form of a categorical syllogism—a common type of

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1329 (Fed. Cir. 2003)); Zortman v. J.C. Christensen & Assocs., Inc., 819 F. Supp. 2d 874, 877 & n.3 (D. Minn. 2011); Optigen, LLC v. Int'l Genetics, Inc., 777 F. Supp. 2d 390, 402 n.10 (N.D.N.Y. 2011); Adelphia Recovery Tr. v. Bank of Am., N.A., No. 05 Civ. 9050 (LMM), 2010 WL 3452374, at *5 n.8 (S.D.N.Y. Sept. 1, 2010); Garcia v. United States, No. 08 CIV 4733 (HB), 2010 WL 1640224, at *5 (S.D.N.Y. Apr. 21, 2010); Odyssey Marine Expl., Inc. v. Unidentified, Shipwrecked Vessel, 675 F. Supp. 2d 1126, 1132 n.5 (M.D. Fla. 2009), *aff'd*, 657 F.3d 1159 (11th Cir. 2011); Cusamano v. Sobek, 604 F. Supp. 2d 416, 474 n.122 (N.D.N.Y. 2009); IMS Health, Inc. v. Sorrell, 631 F. Supp. 2d 434, 447 n.9 (D. Vt. 2009), *rev'd on other grounds*, 630 F.3d 263 (2d Cir. 2010), *aff'd*, 131 S. Ct. 2653 (2011); Nw. Steel Erection Co. v. Zurich Am. Ins. Co., No. 4:07CV3184, 2008 WL 187687, at *1 & n.5 (D. Neb. Jan. 18, 2008); Bell Atl. Corp. v. MFS Commc'ns Co., 901 F. Supp. 835, 849 (D. Del. 1995); Hellweg v. Comm'r, 101 T.C.M. (CCH) 1261, 1264 (T.C. 2011); Villines v. Harris, 11 S.W.3d 516, 520 n.2 (Ark. 2000); Thomson v. Beuchel, No. B194775, 2007 WL 2181917, at *6 n.6 (Cal. Ct. App. July 31, 2007); Thompson v. Clarkson Power Flow, Inc., 254 S.E.2d 401, 402 n.1 (Ga. Ct. App. 1979); French v. State, 362 N.E.2d 834, 843 n.1 (Ind. 1977) (De Bruler, J., concurring and dissenting); Mark v. Comm'r of Pub. Safety, No. A04-1905, 2005 WL 1089016, at *1 n.3 (Minn. Ct. App. May 10, 2005); Health Pers. v. Peterson, 629 N.W.2d 132, 134 n.3 (Minn. Ct. App. 2001); State v. Clifford, 2005 MT 219, ¶ 67, 328 Mont. 300, 121 P.3d 489 (Nelson, J., concurring); State v. Wetzel, 2005 MT 154, ¶ 30, 327 Mont. 413, 114 P.3d 269 (Leaphart, J., dissenting); Dep't 56, Inc. v. Bloom, 720 N.Y.S.2d 920, 923 (N.Y. Sup. Ct. 2001); Iams v. DaimlerChrysler Corp., 174 Ohio App. 3d 537, 2007-Ohio-6709, 883 N.E.2d 466, at ¶ 55; Edwards v. Riverdale Sch. Dist., 188 P.3d 317, 321 (Or. Ct. App. 2008); Hale v. Water Res. Dep't, 55 P.3d 497, 502 (Or. Ct. App. 2002); Thompson v. State, 108 S.W.3d 269, 278–79 (Tex. Crim. App. 2003) (Keasler, J., joined by Hervey, J., concurring and dissenting); *In re* Luna, 175 S.W.3d 315, 320 n.4 (Tex. App. 2004), *withdrawn per curiam*, 275 S.W.3d 537 (Tex. App. 2008); Manchester Oaks Homeowners Ass'n v. Batt, 732 S.E.2d 690, 699 n.8 (Va. 2012) (en banc).

53. For a discussion of the Fallacies of Illicit Process, or the Fallacies of the Illicit Major Term and Illicit Minor Term, and the treatment of those concepts in case law, see Rice, *Indiscernible Logic*, *supra* note 2. *See generally* Cook v. Moffat, 46 U.S. (5 How.) 295, 299 (1847); Walmsley v. City of Phila., 872 F.2d 546, 554 (3d Cir. 1989) (Aldisert, J., dissenting); Posey v. State, No. CACR 04-610, 2005 WL 1168401, at *2 (Ark. Ct. App. May 18, 2005); State v. Lackey, 208 P.3d 793, 797–98 (Kan. Ct. App. 2009), *rev'd*, 286 P.3d 859 (Kan. 2012); Ochsner v. IdeaLife Ins. Co., 2004-1067, p. 3 (La. App. 4 Cir. 11/8/06); 945 So. 2d 128, 135 (Kirby, J., dissenting); Bailey v. State, 294 A.2d 123, 129 n.4 (Md. Ct. Spec. App. 1972); Council of Orgs. & Others for Educ. about Parochiaid v. Governor of Mich., 548 N.W.2d 909, 920 n.7 (Mich. Ct. App. 1996) (O'Connell, J., dissenting).

54. For a discussion of the Fallacy of the Undistributed Middle and the concept's treatment in case law, see Rice, *Indispensable Logic*, *supra* note 2. *See generally* Spencer v. Texas, 385 U.S. 554, 578–79 (1967) (Warren, C.J., joined by Fortas, J., concurring and dissenting); Funk Bros. Seed Co. v. Kalo Inoculant Co., 333 U.S. 127, 134 (1948) (Frankfurter, J., concurring); Allied Erecting & Dismantling, Co. v. USX Corp., 249 F.3d 191, 202 & n.1 (3d Cir. 2001); Aylett v. Sec'y of Hous. & Urban Dev., 54 F.3d 1560, 1569 (10th Cir. 1995); Hernandez v. Denton, 861 F.2d 1421, 1439 (9th Cir. 1988)

syllogistic argument often found in legal argument.[55] Another formal logical fallacy that follows from a syllogism that fails to comply with the rules of logic is the Fallacy of the Negative Premises,[56] and courts have

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(Aldisert, J., concurring and dissenting), *vacated*, 493 U.S. 801 (1989); McHugh v. Hillerich & Bradsby Co., No. C 07-03677 JSW, 2010 WL 682339, at *4 (N.D. Cal. Feb. 24, 2010), *aff'd per curiam*, 413 F. App'x 240 (Fed. Cir. 2011); Regalado v. City of Chi., No. 96 C 3634, 1999 WL 759502, at *1 (N.D. Ill. Sept. 1, 1999); British Steel PLC v. United States, 929 F. Supp. 426, 436 n.11 (Ct. Int'l Trade 1996); Lucas Aerospace, Ltd. v. Unison Indus., L.P., 899 F. Supp. 1268, 1287 (D. Del. 1995); Foster v. McGrail, 844 F. Supp. 16, 21–22 (D. Mass. 1994); Pearson v. Bowen, 648 F. Supp. 782, 792 n.26 (N.D. Ill. 1986); United States v. Gambale, 610 F. Supp. 1515, 1525 (D. Mass. 1985); Amusement Equip., Inc. v. Mordelt, 595 F. Supp. 125, 130 n.4 (E.D. La. 1984), *aff'd in part*, *rev'd in part*, 779 F.2d 264 (5th Cir. 1985); Lakeland Constr. Co. v. Operative Plasterers Local No. 362, No. 79 C 3101, 1981 U.S. Dist. LEXIS 11584, at *4 n.2 (N.D. Ill. Mar. 24, 1981); Menora v. Ill. High Sch. Ass'n, 527 F. Supp. 632, 636 (N.D. Ill. 1981); PPL Corp. & Subsidiaries v. Comm'r, 135 T.C. 176, 186, 191 n.11 (T.C. 2010); Desilu Prods., Inc. v. Comm'r, 24 T.C.M. (CCH) 1695, 1703 (T.C. 1965); Batty v. Ariz. State Dental Bd., 112 P.2d 870, 873 (Ariz. 1941); Nickolas F. v. Superior Court, 50 Cal. Rptr. 3d 208, 221–22, 222 n.17 (Cal. Ct. App. 2006); People v. Martinez, 74 P.3d 316, 321–22, 321 n.5 (Colo. 2003) (en banc); Royer v. State, 389 So. 2d 1007, 1016 (Fla. Dist. Ct. App. 1979), *aff'd*, 460 U.S. 491 (1983); Barham v. Richard, 97-0186, pp. 5–6 (La. App. 4 Cir. 4/9/97); 692 So. 2d 1357, 1359; State v. Star Enter., 95-2124, 95-2287, p. 16 n.8 (La. App. 4 Cir. 8/7/96); 691 So. 2d 1221, 1229 n.8; Wein v. Carey, 362 N.E.2d 587, 590–91 (N.Y. 1977); Hicks v. State, 241 S.W.3d 543, 546 (Tex. Crim. App. 2007); Rushing v. Commonwealth, 726 S.E.2d 333, 338 n.2 (Va. 2012), *abrogated by* VA. CODE ANN. § 19.2-324.1 (West, Westlaw through 2015 Reg. Sess.); State v. Zespy, 723 P.2d 564, 570 n.1 (Wyo. 1986) (Urbigkit, J., concurring in part and dissenting in part).

55.   *See* VANDEVELDE, *supra* note 12; *see also* COPI & COHEN, *supra* note 31, at 181–82; W. EDGAR MOORE, CREATIVE AND CRITICAL THINKING 194 (1967) ("[A] *categorical* proposition names or describes two classes and states a relationship between them.").

> A categorical proposition is made up of four components, the quantifier, the subject term, the copula, and the predicate term. A quantifier is of one of two types: the universal quantifier 'all' or the particular (existential) quantifier 'some'. A term is a word that stands for a class of individuals, called the 'extension' of that class. For example, the term 'stunt pilots' stands for the class of stunt pilots. A copula is a form of the verb 'is' or 'are' that joins one term to another. The subject term stands for a class said to belong, or not to belong, to another class, denoted by the predicate term. . . . [T]he example . . . 'Some accountants are daredevils' is a categorical proposition, because it can be paraphrased as 'Some accountants are individuals who are daredevils'.

DOUGLAS WALTON, FUNDAMENTALS OF CRITICAL ARGUMENTATION 54–55 (2006).

56.   *See* COPI & COHEN, *supra* note 31, at 247–48. The *Fallacy of Negative Premises* is the name given to an argument that violates the following rule of formal logic: "If either premise is negative, the conclusion must be negative." *Id.*; *see also* MICHAEL F. GOODMAN, FIRST LOGIC 76 (1993) ("If one premise in a categorical syllogism is Negative, then the conclusion must also be Negative, for the syllogism to be valid."); HURLEY, *supra* note 35, § 5.3, at 258 ("A negative premise requires a negative

used this formal logical fallacy to evaluate legal argument.[57]

Legal opinions that use formal logic to evaluate legal arguments demonstrate something important about the role of formal logic in legal argument and its practical value to lawyers and judges. Rarely do courts acknowledge that a logically invalid argument has persuasive value. However, the fact that an argument might be logically fallacious does not necessarily mean that the advocated conclusion must be rejected, but it does mean that the argument itself must be rejected. The language and rules of formal logic provide important tools for evaluating and describing what is good and bad about an argument's form. Importantly, the language and rules of formal logic can help lawyers plan and evaluate their arguments to ensure that the architecture of an argument represents support, rather than an impediment, for the advocate's proffered conclusion.

To illustrate, consider a single, simple concept of logic that is familiar to every lawyer—disjunction—and see this concept in the context of formal logic.

III. LOGICAL AMBIGUITY, FORMAL LOGICAL FALLACY, AND THE MEANING OF THE WORD *OR* IN LEGAL ARGUMENT

A. Disjunction and the Practical Problems of Ambiguity, Negation, and Logical Fallacy

A common example of the power and problems caused by logical form can be seen in one of the simplest and most familiar of logical concepts—disjunction. The English word *or* appears in countless legal arguments, briefs, contracts, and statutes. You have already encountered the word *or* in this Article; its meaning, pronunciation, and use seem obvious, as does the difference between *or* and *and*. While logicians have written about the word *or*, which they refer to in the context of a *disjunction*,[58] for more than 2,000 years,[59] lawyers have made legal

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conclusion, and a negative conclusion requires a negative premise.").

57. For a discussion of the Fallacy of the Negative Premise and the concept's treatment in case law, see Rice, *Integrity of Legal Argument*, *supra* note 2. *See generally Walmsley*, 872 F.2d at 554 (Aldisert, J., dissenting); Kolakowski *ex rel.* Kolakowski v. Sec'y of Health & Human Servs., No. 99-0625V, 2010 WL 5672753, at *1 (Fed. Cl. Nov. 23, 2010); City of Wichita v. Stevenson, 265 P.3d 598 (Kan. Ct. App. 2011) (per curiam) (unpublished table decision); *Lackey*, 208 P.3d at 797–98; *Ochsner*, 945 So. 2d at 135 (Kirby, J., dissenting); State v. Weber, 247 P.3d 782, 786 (Wash. Ct. App. 2011).

58. Some logicians prefer the term *alternation* rather than *disjunction*. *See, e.g.*, COPI

arguments without any knowledge of those philosophical discussions for nearly as long.

Lawyers generally understand disjunction very well, but some have also misunderstood the word *or* from time to time. For example, consider the following sentence: "The plaintiff has failed to raise a genuine dispute about any material fact regarding negligence or causation in this case."[60] The meaning of that statement at first glance seems clear. However, there are three potential readings of these words, all of which are entirely dependent on the nature of the logical form of the sentence—specifically, on the nature of disjunction. First, does the sentence mean that the plaintiff failed to raise both a genuine dispute of material fact regarding negligence and a genuine dispute of material fact regarding causation? Alternatively, does the sentence mean that the plaintiff failed to raise an issue of material fact regarding negligence but raised a genuine dispute regarding causation? Or does it mean that the plaintiff raised a genuine dispute of material fact regarding negligence but failed to raise a genuine dispute regarding causation? The ambiguity is a consequence of what the word *or* means.[61] Explaining the result is a function of learning just a little bit about logical form and the nature of disjunction. Mastering a bit of this logic can help both neophytic lawyers and masters of legal argument become better litigators, legal drafters, and

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& COHEN, *supra* note 31, at 321.

59. *See* Daniel Bonevac & Josh Dever, *A History of the Connectives*, *in* 11 HANDBOOK OF THE HISTORY OF LOGIC 182–83 (Dov M. Gabbay et al. eds., 2012) (discussing the Stoic philosophers' understanding of disjunction, including the inclusive and exclusive forms of disjunction); *see also* Robert H. Schmidt, *The Influence of the Legal Paradigm on the Development of Logic*, 40 S. TEX. L. REV. 367, 367 (1999) ("Argumentation and debate were practiced in the Athenian law courts long before the reasoning process was itself subjected to thematic treatment by Plato, Aristotle, and the Stoics, resulting in the discipline that is now called 'logic.' This legal background surely provided these philosophers with numerous concrete examples of both valid and fallacious reasoning.").

60. This statement represents an argument that is commonly made by defense lawyers in negligence cases. Typically, at the close of the discovery phase of a negligence lawsuit, the defendant will move for dismissal of some or all of the claims by asking the court to grant a motion for summary judgment. The classic elements of a negligence claim include duty, breach, causation, and damages. Failing to prove any one of the four elements will result in an unsuccessful negligence claim. Accordingly, failing to create a genuine dispute regarding any material fact (i.e., an issue that requires resolution of a fact-based dispute) will prevent the action from moving forward to trial and will require the entry of a judgment in favor of the defendant as a matter of law. *See* FED. R. CIV. P. 56(a).

61. COPI & COHEN, *supra* note 31, at 321.

legal reasoners.

In legal argument, problems with the logical force of *or* commonly[62] present themselves in three ways. First, the different meanings in disjunction can create confusion in understanding the intent of statutory language, contractual language, legal rules, and legal argument.[63] This first problem might be described as one of simple ambiguity.[64] Disjunction is used in different ways, and the failure to clarify intent causes problems.[65] Second, disjunction is commonly used in conjunction with negation in language and argument because rules frequently deal with alternative elements. While one side in a legal argument can win by proving one element or the other, the opponent predictably argues that the failure to establish one element or the other is dispositive of the opponent's argument. The combination of disjunction and negation presents its own set of problems in legal argument. Third, legal argument frequently takes the form of a syllogism; therefore, disjunction in syllogistic argument must play by certain rules of formal logic. When the use of disjunction fails to adhere to those syllogistic rules, the argument fails along with it. The rules of disjunction, along with understanding potential ambiguities, help lawyers and judges make and evaluate legal arguments.

B. The Logic of Disjunction

In logic, a disjunctive statement includes two terms.[66] The two terms are called *disjuncts*.[67] A *disjunction* is the relationship between the two disjuncts.[68] Consider the following statement: "A participant in a cross-examination is either a witness or a lawyer." In this statement, there are two disjuncts—*witness* and *lawyer*.

Logic recognizes two forms of disjunction not revealed in the English word *or*.[69] One form is referred to as an *inclusive disjunction*.[70]

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62. Layman E. Allen, *Symbolic Logic: A Razor-Edged Tool for Drafting and Interpreting Legal Documents*, 66 YALE L.J. 833, 842 (1957) (describing the distinction between exclusive and inclusive disjunction as a "prevalent source of ambiguity").

63. *Id.*

64. *Id.*

65. *Id.*

66. COPI & COHEN, *supra* note 31, at 321.

67. *Id.*

68. *See id.*

69. *See id.*

70. *Id.* This form of disjunction is sometimes called the weak form of disjunction. *Id.*

"An inclusive disjunction is true if one . . . *or both* [of the] disjuncts are true; only if both disjuncts are false is their inclusive disjunction false."[71] Consider the following statement: "A contract is within[72] the statute of frauds if it is for the sale of land or if it requires more than one year to complete."[73] Under the inclusive form of disjunction, this statement would be true if a contract was for the sale of land; it would also be true if the contract required more than one year to complete; and it would also be true if the contract was a contract for the sale of land that required more than one year to complete.

Alternatively, the other form of disjunction is referred to as an *exclusive disjunction*.[74] An exclusive disjunction is true only if one disjunct is true and the other is false.[75] And thus if the word *or* is intended to be used as an exclusive disjunction, then the example above regarding the statute of frauds would be false because a contract will be within the statute of frauds even if it is both for the sale of land and

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71. *Id.* (emphasis added); *see also* Allen, *supra* note 62, at 847 ("An inclusive disjunction is a statement that asserts that one or the other, *or both*, of its subsidiary propositions are true.").

72. When a contract fits the criteria for one of the categories enumerated in the statute of frauds, it is generally required to be in writing in order for it to be enforceable. When a contract meets the criteria of one or more of those categories, it is said to be "within" the statute of frauds. RESTATEMENT (SECOND) OF CONTRACTS § 110 cmts. a–b (AM. LAW INST. 1981).

73. *See id.* § 110(1)(d)–(e).

> (1) The following classes of contracts are subject to a statute, commonly called the Statute of Frauds, forbidding enforcement unless there is a written memorandum or an applicable exception:
>
>> (a) a contract of an executor or administrator to answer for a duty of his decedent (the executor-administrator provision);
>> (b) a contract to answer for the duty of another (the suretyship provision);
>> (c) a contract made upon consideration of marriage (the marriage provision);
>> (d) a contract for the sale of an interest in land (the land contract provision);
>> (e) a contract that is not to be performed within one year from the making thereof (the one-year provision).

Id. § 110(1). While the "classic" statute of frauds includes more than two categories, only two are utilized in the example statement in order to simplify the role of disjunction.

74. *See* COPI & COHEN, *supra* note 31, at 321. This form of disjunction is sometimes called the strong form of disjunction. *Id.*; *see also* Allen, *supra* note 62, at 847 ("An exclusive disjunction is a statement that asserts the truth of one or the other of its two subsidiary propositions, but not both.").

75. *See* COPI & COHEN, *supra* note 31, at 321.

requires more than one year to complete.

Even this limited discussion of the logic of disjunction illuminates the potential problem with the prior-stated argument that "the plaintiff has failed to raise a genuine dispute about any material fact regarding negligence or causation in this case." We can see now that as a matter of logic, there is likely an unintended ambiguity.[76] Logic, as previously mentioned, recognizes two specific types of disjunction.[77] The English[78] word *or* is not specific, resulting in some ambiguity.[79] Accordingly, the lawyer who drafted this sentence likely had no understanding of the ambiguity inherent in the word *or* but fully intended to use it in its inclusive sense. The lawyer probably believed that the statement would be right not only if the plaintiff had failed to establish either disjunct but also if the plaintiff had failed to establish *both* disjuncts.

Logicians occasionally use a device called a *truth table*[80] to evaluate and illustrate the importance of logical operators like disjunctions.[81] A truth table is most effective when a logical statement is reduced to its most basic logical structure.[82] This can be accomplished by identifying the logical operator and assigning simple names, or letters, to represent the terms in the statement.[83] In the above example, we might use the letter *A* to represent the disjunct "raised a genuine dispute of material fact regarding negligence" and the letter *B* to represent the disjunct "raised a genuine dispute of material fact regarding causation."

A truth table evaluates the status of the statement after each of the disjuncts is assigned a truth value (either "true" or "false").[84] An inclusive disjunction's truth table looks like this:

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76. *Id.*

77. *Id.*

78. Many commentators indicate that, unlike English, Latin resolves this ambiguity with two distinct words, connoting the inclusive meaning and the exclusive meaning respectively. *See* COPI & COHEN, *supra* note 31, at 321 ("The Latin word *vel* signifies weak or inclusive disjunction, and the Latin word *aut* corresponds to the word 'or' in its strong or exclusive sense."). However, scholars have disputed this view. *See* R. E. JENNINGS, THE GENEALOGY OF DISJUNCTION 244–45 (1994) (discussing differing usages of *vel* and *aut* and otherwise discussing historical usage of terms of disjunction).

79. *See* COPI & COHEN, *supra* note 31, at 321.

80. A *truth table* is a graphical presentation that shows the truth values of a logical statement based on the truth value of the terms contained in the statement. *See* ROBERT COGAN, CRITICAL THINKING: STEP BY STEP 107 (1998).

81. *See id.*

82. *Id.*

83. *Id.*

84. *Id.* at 107–08.

A	*B*	*A* or *B*[85]
T	T	T
T	F	T
F	T	T
F	F	F

This form of the truth table is not surprising. When either *A* or *B* is true, then the truth value of the disjunctive "*A* or *B*" must be true.[86] Of course, when neither *A* nor *B* is true, then the truth value of the disjunctive "*A* or *B*" must be false.[87] However, when both *A* and *B* are true, the truth value of the disjunctive must be true.[88] This is the essence of the inclusive disjunctive.[89] If either or both of the disjuncts are true, the statement is true.[90] The truth table for an exclusive disjunction looks different in one significant way:

A	*B*	*A* or *B*[91]
T	*T*	*F*
T	F	T
F	T	T
F	F	F

The difference between the two truth tables is seen on the first line of values. When both *A* and *B* are true, the truth value is false.[92] That is, only one disjunct (not two) may be true in order for the logical statement to be true.[93] For the lawyer making the argument that "the plaintiff has failed to raise a genuine dispute about any material fact regarding negligence or causation in this case," it is important to note that the exclusive disjunctive form of *or* is not at all what the lawyer implied.

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85. *See* COLIN HOWSON, LOGIC WITH TREES: AN INTRODUCTION TO SYMBOLIC LOGIC 7 (2005); JOEL RUDINOW & VINCENT E. BARRY, INVITATION TO CRITICAL THINKING 205 (6th ed. 2008).
86. *See* RUDINOW & BARRY, *supra* note 85.
87. *Id.*
88. *Id.*
89. *Id.*
90. *Id.*
91. *See id.*; HOWSON, *supra* note 85, at 9.
92. HOWSON, *supra* note 85, at 9.
93. *Id.*

Fortunately for the lawyer, listeners are not likely to infer the exclusive disjunctive form of *or*.[94] However, as demonstrated below, the ambiguity inherent in disjunction does cause problems in legal argument and drafting.

C. The Problems of Disjunction and Negation

The ambiguity in disjunction causes at least two more common reasoning and argument problems. The example given in the previous section illustrates the first problem. In the argument that "the plaintiff has failed to raise a genuine dispute about any material fact regarding negligence or causation in this case," there is more than one logical operator. In addition to including the disjunctive term *or*, the argument is also phrased in the negative (e.g., "plaintiff has failed").[95] Logicians call this a *negation*.[96] In an argument, sometimes a single term is referred to in the negative;[97] at other times, an entire logical operation is referred to in the negative.[98] Reduced to its logical substructure and symbols, this sentence might be summarized as "–(A or B)." This statement can be varied by applying the negation to only one of the two disjuncts. For example, it might be stated that "the plaintiff has either raised a genuine dispute of material fact regarding negligence or not raised a material fact regarding causation in this case." In this variation of the first argument, the first term ("raised a genuine dispute of material fact regarding negligence") is stated in the positive, but the second term ("raised a material fact regarding causation") is negated.[99] Reduced to its logical substructure and symbols, the sentence might be summarized as "A or $-B$." Accordingly, the application of the negation to both disjuncts or to

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94.   There is some debate about whether common English usage of the word *or* adopts the inclusive form. *See, e.g.*, Stephen Crain & Rosalind Thornton, *Unification in Child Language*, *in* FROM GRAMMAR TO MEANING: THE SPONTANEOUS LOGICALITY OF LANGUAGE 236–37 (Ivano Caponigro & Carlo Cecchetto eds., 2013) ("Despite the circumstantial evidence that English 'or' is inclusive disjunction, the literature on human reasoning, and the usage-based account of language acquisition, have reached a different conclusion. Advocates of this perspective contend that disjunction in human languages is exclusive-*or*, for both children and adults, except in special circumstances."). For a discussion of some studies that reach conflicting results regarding various understandings of disjunction among English speakers, see *id.*

95.   COPI & COHEN, *supra* note 31, at 320.

96.   *Id.* A *negation* is sometimes referred to as a *contradictory* or a *denial*. *Id.*

97.   *Id.*

98.   *Id.*

99.   *Id.*

just one disjunct makes an important logical difference. This difference must be carefully considered and precisely stated to avoid any confusion in making the argument.

While the potential for ambiguity in disjunction raises the possibility of confusion, a negated disjunction creates an entirely new range of potential misunderstandings.[100] In the case of a negated disjunction, the arguer's intention seems less likely to be inferred by the recipient of the argument than it would in the case of a simple disjunction. Consider the following simple example: "The author is not handsome or smart." While many disjunctions are plainly inclusive, negated disjunctions are more complex and more likely to cause a misunderstanding. For example, is this statement suggesting that the author is either unhandsome or smart but not both? Or is this statement suggesting that the author is neither handsome nor smart? Part of the problem is that arguers sometimes use disjunctive operators in negated statements when they actually intend to use the word *and*, a logical conjunction.[101]

The risk of ambiguity in the use of disjunction in legal argument is real.[102] This is because legal argument is often built around legal elements, and multiple elements of legal rules are typically framed either in terms of conjunction or disjunction. That is, the elements of a legal rule are typically all required, or at least one of them is required.[103] When

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100. *See, e.g.*, Vladimir M. Sloutsky & Yevgeniya Goldvarg, *Mental Representation of Logical Connectives*, 57 Q.J. EXPERIMENTAL PSYCHOL. SEC. A 636, 636 (2004) ("Logical connectives, such as 'AND', 'OR', 'IF . . . THEN', and 'IF AND ONLY IF' are ubiquitous in both language and cognition. Their role is particularly prominent in propositional reasoning, for which outcomes often depend on how logical connectives are construed. For example, a golf club's reputation as a 'place for the rich and famous' may leave a wealthy but obscure person wondering whether or not she would fit into the club. This prominence notwithstanding, reasoning with logical connectives is error-prone, with errors often exhibiting systematic patterns.").

101. For the observation that legal writers frequently use the word *or* when they intend a logical operation better described by *and*, see Bruce v. First Fed. Sav. & Loan Ass'n of Conroe, Inc., 837 F.2d 712, 714–15, 715 n.2 (5th Cir. 1988).

102. *See* COPI & COHEN, *supra* note 31, at 321.

103. Occasionally, rules fit into another category where some, but not all, of the elements are required. For example, prior to 1997, "[t]o qualify for partnership-like [federal income] taxation status, [a limited liability company] had to have more than two of the following four characteristics: 1) limited liability of investors, 2) centralized management, 3) free transferability of beneficial ownership interests, and 4) continuity of life or unlimited duration of the business." Carol J. Miller et al., *Limited Liability Companies Before and After the January 1997 IRS "Check-the-Box" Regulations: Choice of Entity and Taxation Considerations*, 25 N. KY. L. REV. 585, 587 (1998) (referring to a previous version of Treasury Regulation § 301.7701-2(a), which is part of what is commonly referred to as the "*Kintner* regulations"); *see also* Thomas M. Hayes,

parties claim that one of the disjuncts in a statute, court rule, or common law cause of action has been met, they will have to manage the inherent ambiguity in disjunction.

One might think that parties claiming to meet *all* of the elements of a statute, court rule, or common law cause of action could avoid the logical problem necessitated by using a disjunction, but logic teaches us that these parties will eventually encounter the same problem as those employing disjunctive arguments. Thus, the plaintiff will make an argument in the form of an affirmative conjunction, as in the following example:

> *Plaintiff's Argument.* The court should grant the plaintiff's motion for summary judgment regarding the plaintiff's breach of contract claim because the discovery in the case demonstrates that both manifestation of assent and a basis of contractual enforcement are uncontradicted by the defendant.

However, the defendant will typically take the opposite position. If the plaintiff's motion seeks to establish the manifestation of assent and a basis of enforcement, the logical form of the defendant's responsive argument will look very different from the plaintiff's argument. Instead of framing the argument as a conjunction, the defendant will frame the argument as a disjunction. Additionally, instead of framing the argument in the positive, the defendant will express the argument in the negative, as in the following example:

> *Defendant's Argument.* The court should deny the plaintiff's motion for summary judgment regarding the plaintiff's breach of contract claim. Discovery in the case demonstrates the plaintiff failed to establish manifestation of assent or a basis of contractual enforcement.

Reduced to its logical substructure and symbols, the plaintiff's argument might be summarized as "*A* and *B*." Whereas, the defendant's argument might be summarized as "−(*A* or *B*)." In this instance, the court would likely know—from the context of the argument—that the

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Note, *Checkmate, the Treasury Finally Surrenders: The Check-the-Box Treasury Regulations and Their Effect on Entity Classification*, 54 WASH. & LEE L. REV. 1147, 1153–54 (1997).

defendant is not using *or* in its exclusive form but rather in its inclusive form; however, there are other times when that result is not so obvious.[104]

As the following examples illustrate, ambiguous disjunction coupled with the negation of terms commonly results in confusion. The potential problems in frequently made arguments are revealed when considering the rules of logic in reviewing some illustrative language:

> *Argument 1*. Counsel has failed to demonstrate that the witness's testimony is relevant, failing to establish that the evidence has a tendency to make a fact more probable or that the fact is of consequence in determining this action.[105]

> *Argument 2*. The prosecution cannot succeed in its home-invasion count because it will fail to establish that the defendant entered a dwelling or that the defendant had the requisite intent.[106]

> *Argument 3*. While concluding that the proffered evidence is hearsay, Counsel has failed to establish either that the testimony is an out-of-court statement or that the evidence is offered to prove the truth of the matter asserted in the statement.[107]

Each of these ordinary, everyday legal arguments involves some implications of formal logic, including the relationship between conjunction, disjunction, and negation. The logical implications of these

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104. *See* cases cited *infra* notes 156–88.

105. Federal Rule of Evidence 401 states as follows: "Evidence is relevant if: (a) it has any tendency to make a fact more or less probable than it would be without the evidence; and (b) the fact is of consequence in determining the action." FED. R. EVID. 401.

106. *See* Rhea v. Jones, 622 F. Supp. 2d 562, 581 (W.D. Mich. 2008).

> The elements of home invasion are (1) breaking and entering (2) a dwelling (3) with intent to commit a felony, larceny or assault in the dwelling. The offense is punishable as a first-degree home invasion if, at the time the defendant was present in the dwelling, he was either armed with a dangerous weapon or another person was lawfully present in the dwelling.

Id. (first citing MICH. COMP. LAWS § 750.110a(2) (2004); and then citing Johnson v. Warren, 344 F. Supp. 2d 1081, 1093 (E.D. Mich. 2004)).

107. Federal Rule of Evidence 801 states as follows: "'Hearsay' means a statement that: (1) the declarant does not make while testifying at the current trial or hearing; and (2) a party offers in evidence to prove the truth of the matter asserted in the statement." FED. R. EVID. 801(c).

arguments sometimes create practical problems. However, tools of philosophical logic exist to help us understand, solve, and communicate solutions to these problems.

D. De Morgan's Laws and Their Application to Arguments Involving Disjunction and Negation

The philosophy of formal logic offers useful tools for analyzing some of the problems created by disjunctions. One tool is the application of De Morgan's laws.[108] De Morgan's laws provide that "[t]he negation of the conjunction . . . is . . . the disjunction of the negations."[109] Further, they provide that "[t]he negation of the disjunction . . . is . . . the conjunction of the negations."[110] Accordingly, when a party argues that "the defendant was not negligent and the cause of the accident," De Morgan's laws require interpreting that statement as "the defendant was not negligent, or the defendant was not the cause of the accident." Thus, De Morgan's laws provide useful tools for understanding the logical

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108. *See* COPI & COHEN, *supra* note 31, at 365 (explaining "De Morgan's theorems" and stating that "[t]he negation of the disjunction of two statements is logically equivalent to the conjunction of the negations of the two statements and . . . [t]he negation of the conjunction of two statements is logically equivalent to the disjunction of the negations of the two statements").

> Th[e] equivalence [identified in De Morgan's laws] allows us to transform a negated disjunction into a conjunction and a negated conjunction into a disjunction. In this way, it can help clear up some common confusions. Thus, knowing that a disjunction is false is different from knowing that each individual disjunct is false. For example, from the fact that it is false that either the economy will improve or the stock market will crash, it does not follow that either the economy will not improve or the stock market will not crash. Rather, by De Morgan's Law, it means that the economy will not improve *and* the stock market will not crash. These are indeed different statements. The first would be true if the economy did not improve and the stock market crashed. The second would be true only if the stock market did *not* crash.
>
>   Some misunderstandings in ordinary life might accordingly be cleared up by the ability to validly make transformations from one form of truth-functional statement to another.

ELLIOT D. COHEN, CRITICAL THINKING UNLEASHED 93 (2009). De Morgan's laws are referred to in different ways, including "De Morgan's laws" and "De Morgan's theorems." The author has preserved the reference used by the original authors in the quotes included throughout this Article, but these references all refer to the same rules set out by Augustus De Morgan.

109. COPI & COHEN, *supra* note 31, at 365.

110. *Id.*

structure of a conjunction or a disjunction in legal rules and argument.[111] As will be discussed below, De Morgan's laws have been used by both litigants and judges in constructing and evaluating legal arguments.

E. The Logical Fallacy of Affirming a Disjunct

The ambiguity of disjunction can create particular problems in legal argument when the argument takes the form of a syllogism. As discussed earlier, formal logic provides the basic logical structure for many kinds of legal arguments. Legal argument frequently takes a simple, familiar form called a *syllogism*.[112] The following argument is described as a syllogism because of its logical form[113]:

> The driver was either watching the immediately preceding vehicle or texting a friend.
>
> The driver was not texting a friend.
>
> Therefore, the driver must have been watching the immediately preceding vehicle.

Furthermore, this particular argument takes the form of a specific kind of syllogism called a *disjunctive syllogism*.[114] A syllogism contains two premises and a conclusion.[115] The first premise, containing a disjunction, is referred to as a *disjunctive proposition*.[116] The disjunctive proposition contains two terms: (1) "the driver was watching the immediately preceding vehicle"; and (2) "the driver was texting a friend."[117]

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111. *See id.* (describing De Morgan's laws as "exceedingly useful").

112. *See* SCALIA & GARNER, *supra* note 11, at 41.

113. *See id.*

114. COPI & COHEN, *supra* note 31, at 298.

115. *See* Kristen K. Robbins, *Paradigm Lost: Recapturing Classical Rhetoric to Validate Legal Reasoning*, 27 VT. L. REV. 483, 492 (2003) ("The quintessential test of the validity of deductive reasoning is the syllogism. The syllogism is comprised of three parts: a major premise, a minor premise, and a conclusion." (footnote omitted) (first citing EDWARD P. J. CORBETT, CLASSICAL RHETORIC FOR THE MODERN STUDENT 43 (3d ed. 1990); then citing *id.* at 49; and then citing GARDNER, *supra* note 30, § 1.2, at 4)).

116. *See* COPI & COHEN, *supra* note 31, at 298.

117. Note that both terms are disjuncts. While strict syllogistic form might be an effective device for crafting and evaluating the logical form of argument, its strict requirements are not always followed when lawyers are communicating their arguments, and those lawyers—trained toward brevity and efficiency in their argument—frequently

Following this disjunctive proposition is a second premise, referred to as a *categorical premise*.[118] Here, the categorical premise is expressed in negated terms: "The driver was not texting a friend." The last element of a syllogism is referred to as a *conclusion*.[119] For instance, the conclusion in the above example is the statement that "the driver must have been watching the immediately preceding vehicle."

Such a syllogism can be reduced to a symbolic form, and several variations are possible. For example, we might summarize the previously mentioned syllogistic argument with the following symbolic form:

$$A \text{ or } B$$

$$-B$$

Therefore, *A*.

This argument takes a valid form. If it is true that the driver was either watching the immediately preceding vehicle ("*A*") or texting a friend ("*B*"), then disproving that the driver was texting a friend ("*–B*") requires the conclusion that the driver was watching the immediately preceding vehicle ("*A*"). This is the power of the syllogistic form.[120] If the premises are true, and the logical form of the syllogism is valid, then logic does not merely suggest the truth of the conclusion—it *compels* the truth of the conclusion.[121] The logical force of the syllogism is what makes it

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speak and write arguments that do not readily expose the details of their logical form. Additionally, practical arguments rarely use all of the terms of the argument and frequently express the elements of argument using inconsistently described terms. For these reasons, evaluation of logical form usually requires taking an argument articulated in natural language, reducing it to its essential terms, and ordering it in a syllogistic form. One logician explained as follows:

> [S]yllogisms, as they occur in ordinary spoken and written expression, are seldom phrased according to the precise norms of the standard-form syllogism. Sometimes quantifiers, premises, or conclusions are left unexpressed, chains of syllogisms are strung together into single arguments, and terms are mixed together with their negations in a single argument.

HURLEY, *supra* note 35, § 5.4, at 264.
   118.   COPI & COHEN, *supra* note 31, at 298–99.
   119.   *Id.* at 298.
   120.   *See* BICKENBACH & DAVIES, *supra* note 42.
   121.   "When an argument is valid, if its premises are true then its conclusion must (necessarily) be true." *Id.*; *see* GOVIER, *supra* note 42; HURLEY, *supra* note 35, § 1.4, at 43; *see also id.* § 1.3, at 31 ("A *deductive argument* is an argument in which the arguer

such a powerful advocacy tool.[122] Conversely, a failure to comply with the required form of a valid syllogism destroys the argument's persuasive power entirely.[123] In fact, a syllogistic argument that takes an invalid form commits a formal logical fallacy.[124]

Some disjunctive syllogisms take an invalid form and commit the Fallacy of Affirming a Disjunct. The Fallacy of Affirming a Disjunct takes the following form:

A or *B*

A

Therefore, $-B$.[125]

Of course, the validity of this form depends on what the word *or* means in the disjunctive proposition. If *or* is used in the inclusive sense, then the argument is invalid, and the premises do not ensure the truth of the conclusion.[126] The fact that *A* is true does not compel a conclusion that *B* is false since both *A* and *B* might be true; in that case, *B* would be just as true as *A*. However, if the disjunctive proposition used the word *or* in its exclusive sense, then the form of the syllogism is entirely valid because it cannot be the case that both *A* and *B* are true; since *A* is true, *B* must be

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claims that it is impossible for the conclusion to be false given that the premises are true." (emphasis omitted)); KILGORE, *supra* note 35 (defining *deductive logic* as "the analysis of arguments whose form requires that in all cases in which the conclusion is false at least one premise also is false"). In the context of legal proof, it has been said that "[i]nference is the essence of proof; proof is good or bad according to the quality and number of inferences drawn from facts to conclusions." COVINGTON, *supra* note 44, at 2.

122. *See* SCALIA & GARNER, *supra* note 11, at 41 (suggesting that their readers "[t]hink syllogistically"). "The most rigorous form of logic, and hence the most persuasive, is the syllogism." *Id.*

123. While a logically fallacious argument cannot support its conclusion, the conclusion might still be true. Demonstrating that an argument is logically fallacious merely requires the party offering the fallacious argument to either find a new, valid argument or to concede defeat.

124. *See* ARNOLD VANDER NAT, SIMPLE FORMAL LOGIC § 5.1, at 287 (2010).

125. *See* KILGORE, *supra* note 35, at 512 (defining *Fallacy of Affirming a Disjunct* as "[a] faulty argument using an inclusive disjunctive statement as a premise and holding that since one disjunct is true, the other disjunct must be false").

126. *See* GEORGE W. RAINBOLT & SANDRA L. DWYER, CRITICAL THINKING: THE ART OF ARGUMENT 168 (2d ed. 2015) ("If a disjunction is exclusive, then affirming a disjunct is a valid form. If a disjunction is inclusive, then affirming a disjunct is an invalid form.").

false.[127] Logical fallacies provide an efficient method for spotting invalid logical form in legal argument by identifying invalid patterns of argument.

IV. COURTS USE LOGIC TO SOLVE PROBLEMS RAISED BY THE AMBIGUITY IN DISJUNCTIVE ARGUMENT

A. Disjunction and the Practical Legal Problems of Ambiguity, Negation, and Logical Fallacy

The previous discussion identified three logical concepts in argument: (1) the logical ambiguity in disjunction; (2) De Morgan's laws as tools for evaluating disjunction, conjunction, and negation; and (3) logical fallacies in disjunctive syllogisms. The common theme among these three devices is the ambiguity in disjunction. Each of the three logical concepts helps us to understand the persuasive power of disjunctive arguments that take a valid form and the role ambiguous disjunction plays in argument. The remainder of this Article moves from argument generally to legal argument specifically and is designed to demonstrate how these devices of logic provide important tools for legal argument. This is demonstrated by examining how courts have used these logical concepts and rules to evaluate legal argument when deciding cases.

B. Courts Have Used Formal Logic to Help Evaluate the Problem of Ambiguity in Disjunction

The ambiguous use of disjunction has long been a problem confronted by courts.[128] However, courts have frequently viewed the problem as a language problem rather than a logic problem.[129] Accordingly, early opinions (as early as 1865) discussed the problem of disjunction in terms of imprecision of language and solved this problem

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127. *See id.*; *see also* KILGORE, *supra* note 35, at 512; W. Kent Wilson, *Formal Fallacy*, *in* THE CAMBRIDGE DICTIONARY OF PHILOSOPHY 316 (Robert Audi ed., 2d ed. 1999) (discussing an "[i]mproper disjunctive syllogism (affirming one disjunct)" and noting the proper form of the syllogism where the disjunction is interpreted exclusively).

128. Allen, *supra* note 62, at 833, 842, 844.

129. *See generally, e.g.*, United States v. Fisk, 70 U.S. (3 Wall.) 445 (1865) (illustrating the judiciary's focus on language over logic).

by discerning the drafter's intent.[130] For example, in *United States v. Fisk*, the United States Supreme Court construed a provision of the 1864 Internal Revenue Act.[131] The Court's construction centered on an amendment to the Act that included a disjunctive term:

> "*Brokers* shall pay $50 *for each license*. Every person, firm, or company (except such as hold a license as banker), whose business it is as a broker to *negotiate* purchases or sales of stocks, exchange, bullion, coined money, bank notes, promissory notes, or *other securities*, shall be regarded as a broker [and shall make oath or affirmation that all their transactions are made for a commission], *provided* that any person holding a license as a banker shall not be required to take out a license as a broker."
>
> On the 3d of March, 1865, Congress passed an act to amend the former act. The last act amends the former by inserting, after the words "*other securities*" (given above in italics), the words "for *themselves* or others;" and by striking out from the paragraph that part of it above included in brackets.[132]

The parties disputed whether the 1865 amendment, including the words "for themselves or others," caused people who purchased stocks for themselves to fit within the definition of *broker*.[133] The Court held that it did not.[134] The Court began its analysis of the statute by recognizing the following principle: "In the construction of statutes, it is the duty of the court to ascertain the clear intention of the legislature. In order to do this, courts are often compelled to construe '*or*' as meaning '*and*,' and again '*and*' as meaning '*or*.'"[135]

The Court further held that the amended language ("for themselves or others") was not intended to be construed as a disjunctive.[136] Instead, it was intended to be read as a conjunctive; only when brokers negotiated purchases of securities for themselves *and* others would they be liable for

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130. *See generally, e.g.*, *id.*
131. *See generally id.*
132. *Id.* at 445 (alteration in original) (first quoting Act of June 30, 1864, ch. 173, § 79, 13 Stat. 223, 252; and then quoting Act of Mar. 3, 1865, ch. 78, sec. 1, § 79, 13 Stat. 469, 472).
133. *Id.* at 445–47 (emphasis omitted) (quoting Act of Mar. 3, 1865, ch. 78, sec. 1, § 79).
134. *Id.* at 446, 448.
135. *Id.* at 447.
136. *Id.* at 447–48.

the license.[137] The Court held that the provision was not applicable to the defendants who were bankers, and it specifically excluded them from the amendment's broker requirements.[138] Notably, the Court reached its decision without resorting to any of the language or conventions of formal logic.[139]

Fisk was not the last time a court confronted the ambiguity in the word *or*.[140] In *United States v. Gomez-Hernandez*, the court—in construing a federal statute—recognized the ambiguous disjunction and the tendency to confuse disjunction with conjunction.[141] In *Bruce v. First Federal Savings & Loan Ass'n of Conroe, Inc.*, the court construed the word *and* as a disjunction when construing a provision of the Thrift Institutions Restructuring Act.[142] In *Morpho Detection, Inc. v. Transportation Security Administration*, the court confronted a similar issue when construing some of Washington's tax provisions.[143]

In *De Sylva v. Ballentine*, a similar problem arose when the Court confronted a disjunction in the Copyright Act:

> We start with the proposition that the word "or" is often used as a careless substitute for the word "and"; that is, it is often used in phrases where "and" would express the thought with greater clarity. That trouble with the word has been with us for a long time: see, *e.g.*, *United States* v. *Fisk*, 3 Wall. 445. In this instance, we need look no further than the very next clause in this same section of the Copyright Act for an example of this

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137. *See id.*

138. *Id.*

139. *See generally id.* (presenting an analysis that is devoid of formal logic).

140. *See* Peacock v. Lubbock Compress Co., 252 F.2d 892, 893 (5th Cir. 1958) (construing a conjunctive term and relying on *Fisk* for the proposition that "the word 'and' is not a word with a single meaning, for chameleonlike, it takes its color from its surroundings. Nor has the law looked upon it as such. It is ancient learning, recorded authoritatively for us nearly one hundred years ago, echoing that which had accumulated in the previous years and forecasting that which was to come, that, 'In the construction of statutes, it is the duty of the [c]ourt to ascertain the clear intention of the legislature. In order to do this, [c]ourts are often compelled to construe "or" as meaning "and," and again "and" as meaning "or"'" (quoting *Fisk*, 70 U.S. (3 Wall.) at 447)).

141. United States v. Gomez-Hernandez, 300 F.3d 974, 978 (8th Cir. 2002).

142. Bruce v. First Fed. Sav. & Loan Ass'n of Conroe, Inc., 837 F.2d 712, 715 & n.2, 719 (5th Cir. 1988). In *Bruce*, the court cited several instances where there was confusion between words of conjunction and disjunction. *See id.* at 715 & n.2.

143. Morpho Detection, Inc. v. Transp. Sec. Admin., 717 F.3d 975, 979 (D.C. Cir. 2013).

careless usage: "... or if such author, widow, widower *or* children be not living, then the author's executors ...." If the italicized "or" in that clause is read disjunctively, then the author's executors would be entitled to renew the copyright if any *one* of the persons named "be not living." It is clear, however, that the executors do not succeed to the renewal interest unless *all* of the named persons are dead, since from the preceding clause it is at least made explicit that the "widow, widower, or children of the author" all come before the executors, after the author's death. The clause would be more accurate, therefore, were it to read "author, widow or widower, *and* children." It is argued with some force, then, that if in the succeeding clause the "or" is to be read as meaning "and" in the same word grouping as is involved in the clause in question, it should be read that way in this clause as well. If this is done, it is then an easy step to read "widow" *and* "children" as succeeding to the renewal interest as a class, as the Court of Appeals held they did.[144]

The ambiguous nature of disjunction creates problems not only when construing statutory or contractual language but also when analyzing legal argument as well. For example, in *Weavertown Transportation Leasing, Inc. v. Moran*, the problem of the ambiguity of disjunction arose during oral arguments in an exchange between the court and counsel for the appellee, Weavertown:

> [The Court]: What are you alleging as consideration or are you alleging no consideration is needed?
> [Weavertown]: I'm alleging no consideration is needed in this matter, Your Honor, that Mr. Moran came to them with an offer to buy these tickets, the license had to be paid, and that actually can be the consideration, that in order to get these season tickets, the license fee had to be paid, Your Honor. My clients did pay that license. So I think a claim has been made and I think the case should go forward.
> [The Court]: I don't think anyone is disputing that, that they paid for the license.

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144. De Sylva v. Ballentine, 351 U.S. 570, 573–74 (1956) (alterations in original) (quoting 17 U.S.C. § 24 (1952)).

[Weavertown]: I understand that, Your Honor.
[The Court]: Can you cite a case on why no consideration is needed in this?
[Weavertown]: No, your honor.[145]

It appears the court intended for its initial question, as provided above, to use the word *or* as an exclusive disjunction.[146] That is, the court believed Weavertown was either alleging that something served as consideration for the contract or that no consideration was needed. Weavertown was actually alleging that while consideration existed, it was not necessary to the enforceability of the claim, but the court did not consider that interpretation.[147]

The court recited the above exchange during trial as dispositive of the issue of consideration, concluding that "Weavertown conceded the absence of consideration at trial."[148] In terms of logic, the court posed a question that it interpreted as an exclusive disjunction: either *A* or *B*, but not *A* and *B*.[149] Weavertown's counsel interpreted the question as an inclusive disjunction: either *A* or *B*, or (*A* and *B*).[150] Weavertown may have intended its response to ensure the survival of its claim, but the court interpreted the response as dispositive.[151] Other courts have also recognized and discussed the inclusive and exclusive nature of disjunction in the course of evaluating legal argument.[152]

Accordingly, some problems with disjunction are as simple as

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145. Weavertown Transp. Leasing, Inc. v. Moran, 834 A.2d 1169, 1173 (Pa. Super. Ct. 2003) (alterations in original) (quoting Notes of Testimony at 52–53, *Weavertown*, 834 A.2d 1169 (Pa. Super. Ct. 2003) (Oct. 29, 2002)).

146. *See id.*

147. *See id.*

148. *Id.*

149. *See id.*

150. *See id.*

151. *See id.* at 1173–74.

152. *See* Rasanen v. Doe, 723 F.3d 325, 335 (2d Cir. 2013) (evaluating appellee's argument that the language of a jury instruction "operate[d] as an exclusive disjunction"); Cook v. E. Sav. Bank, FSB (*In re* Cook), 498 F. App'x 846, 848 n.3 (10th Cir. 2012) ("Mr. Cook assumes ESB's transfer of the property to Spica Properties meant he could no longer redeem by paying ESB, i.e., where the redemption statute provides for payment to the purchaser or its assigns, the 'or' must be read as an exclusive disjunction leaving the assignee the sole party to whom payment may be made after a transfer of the property. ESB assumes the contrary. Neither party cites any relevant authority."); State v. Johnson, 72 P.3d 343, 348 (Ariz. Ct. App. 2003) ("This logical structure creates an exclusive disjunction, allowing transferred intent under (B)(1) if only one of the two components of the result (either the victim or the harm) differs, but not both.").

recognizing the potential ambiguity and confusion presented by disjunction and resolving any ambiguity and confusion by discerning the intent of the language (typically using traditional rules for statutory or contractual construction).[153] However, other problems are more complex. Just as logic provides more complex rules[154] and language tools[155] for

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153. When contractual or statutory language is in doubt, the law provides rules for guiding courts regarding the proper way to construe the ambiguous terms. For example, these rules include the following:

> (1) Words and other conduct are interpreted in the light of all the circumstances, and if the principal purpose of the parties is ascertainable it is given great weight.

> (2) A writing is interpreted as a whole, and all writings that are part of the same transaction are interpreted together.

> (3) Unless a different intention is manifested,
>   (a) where language has a generally prevailing meaning, it is interpreted in accordance with that meaning;
>   (b) technical terms and words of art are given their technical meaning when used in a transaction within their technical field.

> (4) Where an agreement involves repeated occasions for performance by either party with knowledge of the nature of the performance and opportunity for objection to it by the other, any course of performance accepted or acquiesced in without objection is given great weight in the interpretation of the agreement.

> (5) Wherever reasonable, the manifestations of intention of the parties to a promise or agreement are interpreted as consistent with each other and with any relevant course of performance, course of dealing, or usage of trade.

RESTATEMENT (SECOND) OF CONTRACTS § 202 (AM. LAW INST. 1981) (describing the enumerated rules as "Rules in Aid of Interpretation"); *see also id.* § 203 (providing additional "Standards of Preference in Interpretation"). Similarly, in interpreting statutory language, courts rely on rules of interpretation to resolve ambiguities in the language. *See* United States v. Dauray, 215 F.3d 257, 262 (2d Cir. 2000) (utilizing two canons of statutory construction: (1) "the meaning of doubtful terms or phrases may be determined by reference to their relationship with other associated words or phrases (*noscitur a sociis*)" and (2) "'where general words follow a specific enumeration of persons or things, the general words should be limited to persons or things similar to those specifically enumerated' (*ejusdem generis*)" (citations omitted) (quoting United States v. Turkette, 452 U.S. 576, 581 (1981)) (first citing Dole v. United Steelworkers of Am., 494 U.S. 26, 36 (1990); and then citing United States v. Carrozzella, 105 F.3d 796, 800 (2d Cir. 1997))).

154. *See* COPI & COHEN, *supra* note 31, at 244–49 (describing the rules of formal logic).

155. One writer describes the language of logic as a metalanguage for evaluating argument: "[I]t's necessary to distinguish between the logician's language with its concepts, and the reasoner's language with its concepts. For convenience let's call the

considering the role of logic in argument, so too do courts employ these tools to precisely consider the logical consequences of words and constructions of those words.[156]

For example, in *Vasudevan Software, Inc. v. MicroStrategy, Inc.*, the court was faced with competing arguments regarding how to construe a patent claim.[157] The parties offered competing constructions of the term *disparate databases*.[158] The patent claim described this term as meaning "databases having an absence of compatible keys or record identifier columns of similar value or format in the schemas or structures that would otherwise enable linking data."[159] The plaintiff, Vasudevan Software, proposed that the term be interpreted as meaning "databases having an absence of compatible keys OR an absence of record identifier columns of similar value OR an absence of record identifier columns of similar format in the schemas or structures that would otherwise enable linking data."[160] On the other hand, the defendant, MicroStrategy, proposed that the term be interpreted as meaning "databases having an absence of compatible keys AND an absence of record identifier columns of similar value AND an absence of record identifier columns of similar format in the schemas or structures that would otherwise enable linking data."[161]

In assessing MicroStrategy's interpretation, the court evaluated the argument in terms of formal logic—even utilizing De Morgan's laws in the course of its logical analysis:

> Yet, MicroStrategy's interpretation is not necessarily at war with the plain language of the claim term as previously construed, albeit for an initially counterintuitive reason. As MicroStrategy points out, a basic rule of logic known as De Morgan's law holds that the statement *not* (p *or* q) is equivalent to the statement (*not* p) *and* (*not* q) and, as a logical corollary, the statement *not* (p *and* q) is the same as (*not* p) *or* (*not* q). In

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logician's language the *metalanguage* and the reasoner's language the *object language*." Wilfrid Hodges, *The Scope and Limits of Logic*, *in* PHILOSOPHY OF LOGIC 43 (Dale Jacquette ed., 2007).

156. *See generally, e.g.*, Vasudevan Software, Inc. v. MicroStrategy, Inc., Nos. C 11-06637 RS, C 11-06638 RS, 2013 WL 5288267 (N.D. Cal. Sept. 19, 2013).

157. *See id.* at *1.

158. *Id.*

159. *Id.* (quoting language from the claims of two of the patents at issue).

160. *Id.* at *2.

161. *Id.*

this way, "a disjunction may be converted into a conjunction and a conjunction may be converted into a disjunction if (1) the quality (*i.e.,* either affirmative or negative) of the conjunction or disjunction is changed." For example, Article II, Section 1 of the United States Constitution establishes that in order to be eligible to hold the office of President of the United States, a person must be a natural born citizen of this country *and* thirty five years old. Another way to state this same proposition is, in order to be eligible to hold the office of President, you must *not* be foreign born *or* under the age of thirty five. Similarly, consistent with common English usage and syntax, the construction of the claim term "disparate [ ] databases" written as an *absence* of (A *or* B *or* C) is the same as an (*absence* of A) *and* an (*absence* of B) *and* an (*absence* of C).[162]

The logical force of MicroStrategy's argument played an important role in the overall outcome of the case.[163]

Similarly, in *United States v. 890 Noyac Road*, the plaintiff used De Morgan's laws to explain the logical consequence of the elements of a statutory defense.[164] The statutory language at issue was the Comprehensive Crime Control Act's "innocent owner" defense to a forfeiture proceeding.[165] That Act states, in pertinent part, as follows:

> (a) Property subject
>   The following shall be subject to forfeiture to the United States Government and no property right shall exist in them:
>   . . .

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162. *Id.* at *4 (citation omitted) (quoting John P. Finan, *LAWGICAL: Jurisprudential and Logical Considerations*, 15 AKRON L. REV. 675, 684 (1982)). The court held that the prosecution history of the "patents-in-suit" was more compelling than MicroStrategy's logic-based argument, explaining as follows:

> The basis for the clarification adopted by this order is grounded in the prosecution history of the patents-in-suit as opposed to grammatical rules. It is, nonetheless, instructive to note that the interpretation offered by MicroStrategy is consistent with the construction adopted in the Claim Construction Order, in light of the logical meaning of language as discussed above.

Id.
163. *See id.* at *1, *5.
164. United States v. 890 Noyac Rd., 739 F. Supp. 111, 113 (E.D.N.Y. 1990), *rev'd*, 945 F.2d 1252 (2d Cir. 1991).
165. *Id.* at 112.

(7) All real property, including any right, title, and interest (including any leasehold interest) in the whole of any lot or tract of land and any appurtenances or improvements, which is used, or intended to be used, in any manner or part, to commit, or to facilitate the commission of, a violation of this title punishable by more than one year's imprisonment, except that no property shall be forfeited under this paragraph, to the extent of an interest of an owner, by reason of any act or omission established by that owner to have been committed or omitted without the knowledge or consent of that owner.[166]

The claimant argued that the language "knowledge or consent of that owner" required that she prove either lack of knowledge or lack of consent to take advantage of the defense.[167] She supported her interpretation using formal logic:

Claimant argues that she can establish her "innocent owner" defense by demonstrating *either* that she lacked knowledge *or* that she lacked consent to the illegal activity on the defendant premises. In other words, claim[ant] argues that her burden will be met, and the defense proven, if she can show either one or the other. Claimant relies principally on the opinion in *171–02 Liberty Avenue.* There the claimant asserted that his conceded knowledge of the illicit activities was not enough to render the "innocent owner" defense unavailable to him. In its analysis, the court found that "the statutory language is all the court has to go on," and then stated that "under normal [canons] of statutory construction, the court must give effect to Congress' use of the word 'or' by reading the terms 'knowledge' and 'consent' disjunctively." Hence the court reasoned that if "or" was considered a disjunctive word, a claimant's innocence would be evinced by showing one *or* the other. In other words, the court found that the statute would create an affirmative defense where the illegal activities giving rise to the forfeiture "occurred without the knowledge *or without the consent* of the owner."

Plaintiff finds fault with the opinion in *171–02 Liberty Avenue* and maintains that § 881(a)(7) requires an owner to

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166.   *Id.* (alteration in original) (emphasis omitted) (quoting 21 U.S.C. § 881 (1988)).
167.   *Id.* at 112–13 (quoting 21 U.S.C. § 881(a)(7)).

prove *both* that she lacked knowledge of, *and* that she did not consent to the illegal drug activity. Through an exposition of what it calls elementary principles of logic, plaintiff, in essence, asserts that the phrase "knowledge or consent" must be read as a compound phrase.

Plaintiff cites "Demorgan's Law" for the proposition that a compound phrase requires only one property to be met if the compound proposition ("knowledge or consent") is to be filled. Accordingly, plaintiff argues, for an owner to prove that she *did not* meet the compound property ("knowledge or consent") she must prove that she had *neither* knowledge nor consent. That is to say, she must prove that she had no knowledge and also that she did not consent to the illegal activity.[168]

As in *Vasudevan Software* and *890 Noyac Road*, the logic of De Morgan's laws played a pivotal role in *EarthGrains Baking Cos. v. Sycamore Family Bakery, Inc.*—a case that involved the interpretation of contractual language.[169] The disputed language was as follows:

> In the event that, as of January 1, 2010, Sycamore and/or his permitted assigns have not commenced and do not regularly distribute products under the Sycamore Trademarks within any State within the Licensed Territory, then the License granted by Metz for any State within the Licensed Territory in which such products are not then distributed by Sycamore and/or his permitted assigns shall be terminated (the "Forfeited Territory") and all rights therein for such State shall revert back to Metz.[170]

EarthGrains argued that Sycamore had to meet both conditions to avoid forfeiture under the contract.[171] Specifically, EarthGrains argued that Sycamore had to meet two requirements to avoid forfeiture: (1) commence distributing products; and (2) regularly distribute

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168. *Id.* at 113 (citations omitted) (quoting United States v. 171–02 Liberty Ave., 710 F. Supp. 46, 50 (E.D.N.Y. 1989) (emphasis added)).

169. EarthGrains Baking Cos. v. Sycamore Family Bakery, Inc., 573 F. App'x 676, 678, 680 (10th Cir. 2014).

170. *Id.* at 680 (quoting First Amended Complaint exh. A at 2, Sara Lee Corp. v. Sycamore Family Bakery, Inc., No. 2:09-cv-523 (D. Utah Oct. 5, 2009), 2009 WL 7034832 [hereinafter Exhibit A]).

171. *Id.*

products.[172] Conversely, Sycamore argued that it had to meet only one of these requirements: (1) commencing distribution; or (2) regularly distributing products.[173] The parties agreed that Sycamore commenced distribution.[174] The parties also agreed that Sycamore failed to regularly distribute products.[175] Accordingly, the dispute turned on the court's construal of the disjunctive term in the contract.[176] The court relied on the logical force of the disjunctive and illustrated the logical consequence using De Morgan's laws:[177]

> The two clauses connected by the word "and" are both preceded by a negative ("have *not* commenced and do *not* regularly distribute"). According to De Morgan's laws, "not A *and* not B" is equivalent to "not (A or B)." We thus conclude that the most appropriate reading of the contract requires forfeiture only if Sycamore had not commenced *and* did not regularly distribute products as of January 1, 2010.[178]

Recently, in *Schane v. International Brotherhood of Teamsters Union Local No. 710 Pension Fund Pension Plan*, the Seventh Circuit demonstrated that formal logic, specifically De Morgan's laws, requires more than construing language as disjunctive.[179] Due to the ambiguity in disjunction, the context within which the disjunction is placed is important:

> In propositional logic, this move—the rule of inference that *not (X or Y)* is equivalent to *not X and not Y*—is known as one of "De Morgan's Laws." Formal notation aside, the point is merely that determining the meaning of *or* in a sentence is not just a matter of declaring that the word is disjunctive. Context matters.[180]

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172. *Id.*

173. *Id.*

174. *Id.*

175. *Id.*

176. *See id.*

177. *Id.*

178. *Id.* (citations omitted) (quoting Exhibit A, *supra* note 170).

179. Schane v. Int'l Bhd. of Teamsters Union Local No. 710 Pension Fund Pension Plan, 760 F.3d 585, 589–90 (7th Cir. 2014).

180. *Id.* (citation omitted) (citing LAWRENCE M. SOLAN, THE LANGUAGE OF JUDGES 49

Furthermore, in *Korman v. Walking Co.*, the court interpreted the proper application of the Fair and Accurate Credit Transactions Act of 2003 ("FACTA").[181] A provision of FACTA requires that businesses comply with a requirement regulating what information can be printed on a receipt generated from a credit card transaction.[182] The provision provided as follows:

> Except as otherwise provided in this subsection, no person that accepts credit cards or debit cards for the transaction of business shall print more than the last [five] digits of the card number or the expiration date upon any receipt provided to the cardholder at the point of the sale or transaction.[183]

The court's analysis focused on the interpretation of the following language: "more than the last [five] digits of the card number or the expiration date."[184] The defendant argued that since it had only printed the expiration date and not more than five digits of the credit card, the elements of FACTA had not been established.[185] Stated otherwise, the defendant read the disjunctive term *or* as a conjunction, arguing that the penalties in the statute apply only when a defendant prints more than five digits *and* prints the expiration date.[186] The court disagreed, referring to De Morgan's laws in its explanation.[187] It construed the provision as

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(1993)).

181. *See* Korman v. Walking Co., 503 F. Supp. 2d 755, 756 (E.D. Pa. 2007).

182. *Id.* at 756–57.

183. *Id.* at 757 (quoting 15 U.S.C. § 1681c(g)(1) (2006)).

184. *Id.* at 759–60 (quoting 15 U.S.C. § 1681c(g)(1)).

185. *Id.*

186. *Id.*

187. *Id.* at 760 & n.6.

> The Court is mindful of the Third Circuit's explanation of DeMorgan's Theorem:
>
> > Whether requirements in a statute are to be treated as disjunctive or conjunctive does not always turn on whether the word "or" is used; rather it turns on context. For example, if a statute provides that "no cars or motorcycles are allowed in the park," a person trying to keep a vehicle out of the park need only show that the vehicle is either a car or a motorcycle. From that perspective the statute is disjunctive. On the other hand, a person trying to bring a vehicle into the park must show both that it is not a car and that it is not a motorcycle. From that perspective, the statute is conjunctive. Depending on the relevant context, a disjunctive test can always be reformulated as a conjunctive one.

prohibiting either conduct:

> Here, to bring a successful suit under FACTA, the consumer must show that she was given a receipt with *either* 6+ credit card digits *or* the credit card's expiration date. To successfully defend a suit under FACTA, the merchant must show that it provided a receipt with *both* [five] or fewer credit card digits *and* no expiration date.[188]

The court's conclusion represents an application of De Morgan's laws. Stated symbolically, the statute provides that a business violates the statute when *A or B*. A business defends against an allegation of violating the statute when it negates *A or B*—that is, "–(*A* or *B*)." De Morgan's laws provide that the negation of a disjunction is the conjunction of the negations; thus, "–(*A* or *B*)" is equivalent to "(–*A*) and (–*B*)."[189]

Just as courts have found the logic of De Morgan's laws useful in evaluating disjunctive argument, the Fallacy of Alternative Disjunction has also found a place in the rules and language that courts use to evaluate legal argument. In *Spinetti v. Service Corp. International*, the court used the formal logic of disjunction to explain the proper role of alternative statutory bases for the recovery of arbitration costs.[190] The district court had ruled that *either* the employer *or* the employee in the case was required to pay the costs of arbitration.[191] The appellate court approved the district court's analytical approach for concluding that an employer should pay the arbitration costs in the case because the district court had determined that the employee should not be required to pay those costs in that case.[192] The appellate court's opinion (authored by a jurist who was no stranger to the rules of formal logic[193]) provided

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Id. at 760 n.6 (quoting United States v. One 1973 Rolls Royce, 43 F.3d 794, 815 (3d Cir. 1994)).

188. *Id.*

189. *See id.*

190. *See* Spinetti v. Serv. Corp. Int'l, 324 F.3d 212, 217 (3d Cir. 2003).

191. *Id.*

192. *Id.*

193. *Id.* at 213. The opinion was written by Judge Ruggero J. Aldisert. Judge Aldisert was a senior judge for the United States Court of Appeals for the Third Circuit. He wrote several opinions discussing logic in legal argument, and he is the author of other works specifically addressing formal logic in legal reasoning. *See generally* RUGGERO J. ALDISERT, LOGIC FOR LAWYERS: A GUIDE TO CLEAR LEGAL THINKING (3d ed. 1997);

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justification for a conclusion that the employer must pay those costs and suggested a valid syllogistic argument:

> We make clear what was implicit in the district court's order to compel arbitration, to-wit, the court intended that the employer pay all costs of arbitration and final responsibility for attorney's fees should be governed by the appropriate statute — be it either Title VII or ADEA. Logically, within the rubric of a disjunctive "either-or" proposition, no other alternative can be inferred. The disjuncts are that the employer or employee or both, must pay. Because the court ruled out the employee on the basis that she could not afford to pay, *ergo*, the employer must.[194]

The description of the logical basis for this conclusion provides a practical example of the simple, persuasive force of deductive logic, the conclusion compelled by a disjunctive syllogism, and the absence of a logically fallacious argument. The argument might be symbolically described this way:

$$A \text{ or } B$$

$$-B$$

Therefore, A

The symbol A represents the disjunct "the employer must pay arbitration expenses," and the symbol B represents the disjunct "the employee must pay arbitration expenses." The court concluded that the negation of the disjunct B compels a conclusion that A is true because either A or B must be true. Note that the negation of the term B ensures that the syllogism is well formed. While the absence of B necessitates the existence of A, the existence of B could not allow us to conclude that A is absent. Such a form would have committed the Fallacy of Affirming a Disjunct.[195]

Ruggero J. Aldisert et al., *Logic for Law Students: How to Think Like a Lawyer*, 69 U. PITT. L. REV. 1 (2007).

194. *Spinetti*, 324 F.3d at 217.

195. *See id.* The court impliedly recognized this in its explanation, which made room for the possibility that an inclusive disjunction was intended here: "The disjuncts are that

Similarly, in *National Small Shipments Traffic Conference, Inc. v. United States*, the court used the logic of disjunction to evaluate a party's argument.[196] The petitioner argued that tariff-liability disclaimers, or "inadvertence clauses," were illegal.[197]

> They argue that [§] 11707(c)(1) expressly prohibits tariff liability disclaimers. But the plain language of that section prohibits only those tariff disclaimers that are in violation of [§] 11707. By implication, it would, therefore, follow in logical order that this subsection endorses tariff disclaimers that comply with [§] 11707. This is a classic example of a disjunctive syllogism. Either A or B; but not A; therefore, B. Or as the statute provides: a carrier may not limit liability except as permitted in this subsection; a limitation of liability in violation of § 11707 is void, therefore, a limitation of liability consistent with the regulations of § 11707 is valid.[198]

In the opinion, the court arranged its justification for rejecting the petitioner's interpretation of the statute in the form of a disjunctive syllogism.[199] The petitioner argued that the statute made all tariff-liability disclaimers invalid.[200] The statute provided as follows:

> (c)(1) A common carrier may not limit or be exempt from liability imposed under subsection (a) of this section except as provided in this subsection. A limitation of liability or of the amount of recovery or representation or agreement in a receipt, bill of lading, contract, rule, or tariff filed with the Commission in violation of this section is void.[201]

The court held that not all liability disclaimers were invalid under the

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the employer or employee *or both*, must pay." *Id.* (emphasis added).

196. Nat'l Small Shipments Traffic Conference, Inc. v. United States, 887 F.2d 443, 445–46 (3d Cir. 1989).

197. *Id.* at 443–44.

198. *Id.* at 445–46. This opinion, like the one in *Spinetti*, was written by Judge Aldisert. In fact, the quoted excerpt can also be found in his book *Logic for Lawyers*. *See* ALDISERT, *supra* note 193, at 164.

199. *Nat'l Small Shipments*, 887 F.2d at 445–46.

200. *Id.* at 445.

201. *Id.* (quoting 49 U.S.C. § 11707(c)(1) (1988)).

statute.[202] Some liability disclaimers were invalid, but a subset of disclaimers were authorized and valid under § 11707 of the statute.[203] The court read this provision in the statute as a disjunction:

> A carrier may validly limit liability in accordance with § 11707 or a carrier's limitation of liability is invalid.
>
> The carrier's limitation of liability is not invalid.
>
> Therefore, the carrier's limitation of liability is in accordance with § 11707.[204]

To arrange the argument in a valid form, the court framed the argument in terms of negating one of the disjuncts.[205] This required a choice of words that might not be familiar in order to fit the argument into a valid syllogistic form. It is noteworthy that—in such a circumstance—it is necessary to use the disjunction in the exclusive sense. A limitation of liability is either valid or it is not; it cannot be both valid and invalid. Again, where a disjunction is used in the exclusive sense, a syllogism taking the form of the Fallacy of Affirming a Disjunct would still compel the argument's conclusion.[206]

V. Conclusion: Using the Logic of Disjunction to Make and Evaluate Legal Argument

Each of the previous cases provides evidence and examples that courts use formal logic to understand and evaluate legal argument. Some have used the formal logic of disjunction to identify and resolve the problem of ambiguity in disjunctive terms. Others have used De Morgan's laws to better understand the logical consequences of various interpretations of disjunction, conjunction, and negation. Still others have carefully considered the proper role of disjunction in syllogistic argument. The court's reasoning in *Korman* serves as an example of how logic helps lawyers and judges make and evaluate arguments.[207] Indeed,

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202. *Id.*
203. *Id.*
204. *See id.* at 445–46.
205. *Id.*
206. *See* Rainbolt & Dwyer, *supra* note 126; *see also* Wilson, *supra* note 127.
207. *See* Korman v. Walking Co., 503 F. Supp. 2d 755, 756–57, 759–60, 760 n.6 (E.D.

Korman demonstrates the complex logical problem inherent in even a simple statute composed of a limited number of easily understood elements. In *Korman*, the statutory provision at issue seemed simple and uncomplicated:

> Except as otherwise provided in this subsection, no person that accepts credit cards or debit cards for the transaction of business shall print more than the last [five] digits of the card number or the expiration date upon any receipt provided to the cardholder at the point of the sale or transaction.[208]

The problem with interpreting the statute was not one of understanding the statute's subject matter or any one of the terms; it was in understanding the logical relationship between those terms. In other words, the problem was one where the terms of the statute specifically, and the rules of the law generally, did not provide much guidance. Fortunately, the rules of logic offer guidance for that problem, provide some language tools to communicate the nature of that problem, and offer some solutions for that problem.

Furthermore, the issue in *Korman* illustrates why, procedurally, the logic of disjunction presents itself so frequently in legal argument: Legal rules are frequently articulated by reference to elements, and the precise understanding of the logical relationship between and among elements is essential to persuasive argument and to correct evaluation of argument. The party alleging the application of the rule, and its consequence, does so by establishing those elements.[209] Therefore, the party alleging the elements has the burden of proving the elements.[210] Of course, the parties are in court because the respondent is unwilling to concede the application of the rule and its consequences related to the case. The respondent typically combats the application of the rule by denying the existence of one or more elements,[211] seeking to negate the claimant's

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Pa. 2007).

208. *Id.* at 757 (quoting 15 U.S.C. § 1681c(g)(1) (2006)).

209. *See, e.g.*, Ruggiero v. Krzeminski, 928 F.2d 558, 562 (2d Cir. 1991) ("It is elementary that in a civil action, the plaintiff bears the burden of proof on all essential elements of a claim.").

210. *Id.*

211. Of course, this is not always the case; defendants sometimes raise other defenses. For example, a defendant might argue that an affirmative defense precludes a remedy against the defendant despite the existence of all of the elements of the rule.

allegations.

For example, if the rule requires proof of *A* and *B*, the claimant will seek to prove *A* and *B*; the respondent, of course, will seek to disprove *A* and *B*. Essentially, the respondent's argument is "–*A* and –*B*," or—as De Morgan's laws teach—"–(*A* or *B*)." Therefore, at some level, the logic of disjunction and conjunction are at issue in many legal arguments. A scrupulous understanding of the logical architecture underlying disjunctive rules and arguments is essential in the practice of law.

Ultimately, logical form is an important distinguishing characteristic of the process of legal reasoning.[212] First, it is important because attention to logical form—the architecture of argument[213]—is one method of avoiding capricious or prejudiced decision making. Second, it is important because it helps those engaged in making and evaluating legal argument avoid bad judgments and the consequences resulting from errant reasoning. Third, understanding logical form is important because it provides rules and language for evaluating the logical characteristics of legal argument. Finally, formal logic is a tool that helps lawyers distinguish logically sound legal reasoning from logically fallacious legal reasoning—an important consideration because fallacious arguments often sound valid when in fact they are actually invalid and unreliable.

While legal scholars continue to debate the role logic plays in legal argument, the fact remains that legal arguments sometimes take a deductive form. When they do, lawyers and judges need to evaluate them. Evaluating deductive legal argument requires examining the premises upon which the argument is based and the logical form of the argumentative structure. When that form is invalid, so is the argument. Accordingly, understanding the fundamental rules of logical form provides important insight into the architecture of argument[214] and a basis to reject logically fallacious arguments. A deeper understanding of the important logical characteristics of even a simple concept like disjunction provides a new perspective on legal drafting and a clearer vision of how disjunction plays a role in communicating legal positions, evaluating legal argument, and resolving logical ambiguities.

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212. *See* Vern R. Walker, *Discovering the Logic of Legal Reasoning*, 35 HOFSTRA L. REV. 1687, 1688 n.1 (2007) ("Logic is also distinct from the study of persuasive use of reasoning in human dialogue (for example, pragmatics, rhetoric, or psychology), although it can help identify a reasonable basis for persuasion. Logic is the study of how we ought to reason, if our goal is to discover truth.").

213. *See generally* Raymond, *supra* note 29.

214. *See* Keller, *supra* note 21; *see also* Toal et al., *supra* note 21.