

5.6 Reasoning and Argumentation

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Summary

Drawing on the work of informal logicians, speech communication scholars, rhetoricians, critical-thinking theorists, empirical and theoretical linguists, cognitive and experimental psychologists, dialogue theorists and dialectical logicians, and, more recently, computer scientists and artificial intelligence (AI) theorists, argumentation theory is a large and growing network of enquiry into natural-language argument and its tie to reason-giving and inference. This entry concentrates on theoretical developments from the late 1950s to the present day. My remarks are organized under the following headings: (1) Argument, (2) Reasoning, (3) Toulmin and the Rhetorical Turn, (4) Hamblin Contra the Logicians, (5) The Revival of Fallacy Theory, (6) Informal Logic Contra the Textbooks, (7) Pragma-Dialectics, and (8) More Recent Developments. The coverage is not complete. For want of space, I omit developments in speech communication, rhetoric, and critical thinking, concerning which see Blair (2019).

1. Argument

Logic was founded as a theory of argument. Aristotle's syllogistic logic was the first nonmonotonic, relevant, and paraconsistent logic, and some decent approximation to an intuitionist one, each of which today is termed "nonclassical" (Woods, 2015/2018). Aristotle was also the originator of a metalogic in which he produced a near-perfect proof of the semi-decidability of validity in syllogistically formulated arguments¹ (Corcoran, 1972). The point of mentioning this here is that in most of the approaches to argument under review here, decidability proofs are neither sought nor possible.

Aristotle also placed the analysis of fallacies—*paralogismoi*—on the front burner of logical theory. In 1879 and following, however, logic changed course. Its new purpose was to provide secure foundations for

number theory in a newly created second-order quantificational system in which fallacy theory had no place² (Frege, 1884/1950).

As we have it now, argumentation theory is an investigation of how in various contexts conclusions are arrived at from premisses. Conclusions take different forms—about what is true or false, probable or improbable, plausible or implausible, persuasive or unpersuasive, about what is best to do, most prudent to do, and so on. Although human conclusion-drawing need not be argumentally structured, it is widely believed that premiss–conclusion reasoning can insightfully be *modeled* as premiss–conclusion argument (see, e.g., Mercier & Sperber, 2017).

Two further distinctions call for attention: the first recognizes three different ways in which the consequence-relation manifests itself—consequence-*having* (or entailment), consequence-*spotting* (or recognition), and consequence-*drawing* (or inference). Having is a binary relation between premisses and conclusion. Spotting and drawing require *agents* and hence are ternary relations (Woods, 2013/2014). It is broadly accepted that a theory that works well for entailment also works well for inference. In fact, this is seriously mistaken (Harman, 1970).

While the Trinitarian character of consequence has received little recognition in the literature, our second distinction, that between an argument *as-such* and an argument *in-use*, is at least implicitly grasped. An argument *as-such* is a finite sequence of statements whose terminal member, the conclusion, is a consequence of the other members, its premisses. Arguments *in-use* are what happens to arguments *as-such* when goal-directed agents engage them in support of their various ends. Logics of arguments *as-such* concentrate on the consequence-having relation (Hitchcock, 2017, chapter 7; Woods, 2011). Logics for consequence-spotting and for consequence-drawing are agent centered, goal directed, and (frequently) dynamically interactive.

The word "argument" is an open-textured term, subject to the loose constraints of family resemblance, hence

a term that precludes definition by way of necessary and sufficient conditions. The extension of that term is large and sprawling, stretching from conversationally expressed differences of opinion to counsels' closing summations at trial, newspaper editorials and political cartoons, partisan placards, World Trade Organization negotiations, and nightly *à table* screaming matches between Bill and Sue. Use of the word "argumentation" adds no clarity to this already fuzzy assortment. This is just to say that "argumentation" is no improvement as a synonym of "argument." Even so, in some uses, argumentation is a *theory* of argument, and in others, it is a *theory of theories* of argument (Blair, 2012, pp. 198–199).

Rhetorical studies range more broadly, often with insightful probes into the give-and-take of arguments at their least civilized. Theorists of argument are responsive to varying standards: they can aim for normative accuracy. They can aim for descriptive accuracy. Sometimes they aim for both. A descriptively accurate theory of arguments of kind *K* is an objectively true account of how *K*-arguments are made and how they play out in real life. A normatively accurate theory of arguments of kind *K* is an account of what it takes for a well-made *K*-argument to satisfy what are usually implicit norms of goodness. It would be seriously wrong to assume that these hoped-for goals are only the ones we see listed in the introductory textbooks—deductive validity and inductive strength. A glaring omission is the logic of abductive reasoning (Gabbay & Woods, 2005).

Argument kinds make for a loose and somewhat fuzzy taxonomy, neither exclusive nor exhaustive, and with lots of cross-border traffic. In none of its subdisciplines is there anything resembling full coverage of the extension of the word "argument." In most cases, there are features of it that even the better accounts ignore or downplay. In the dominant approaches, the theorist picks what he takes to be a manageable subset of the word's capacious denotation, with as little offence as possible to the word's also large connotation. This is a perfectly reasonable thing to do and an instructive reminder of the rule not to bite off more than one can chew. Still, subset choices are at some risk of selection bias, which might, in turn, incline a theorist to presume that the theory of his own bite of the pie is in some ways canonical.

2. Reasoning

There is a question about arguing and reasoning. Are they One or Many? On the One view, arguing is just reasoning out loud, whereas reasoning is just arguing with oneself privately. The Many view is supported by the

fact that young human beings routinely draw inferences before acquiring the linguistic means for making arguments. Reasoning is typically a search for conclusions from premisses at hand, whereas arguing is often a search for premisses to support some already hoped-for conclusion. Robert Pinto (1995) sees an argument as an invitation to draw an inference, that is, to adjust the invitee's belief-state in accordance with how its premisses stand to its conclusion and he, the invitee, stands to its premisses. While Sue can invite Bill to draw the conclusion she sees as following from her proffered premisses, Bill is often able to draw his own inferences without invitation and also without the need of having to make the case to himself for drawing it. It would be an overreach to dismiss these solo inferences as inherently defective or subpar. Indeed, the frequency of argumentally *uninvited* inferences considerably exceeds the frequency of invited ones (Woods, 2013/2014).

Another still unsettled question are the relations between good reasoning, good reason-giving, and the exercise of *rationality*. On one finding, a reasoner is reasoning well when (or to extent that) he is reasoning in the way that a rational agent does (or would). Likewise, someone is good at giving good reasons for something when (or to the extent that) she does so in the way that a rational agent does (or would) in those same circumstances. Especially pinching is the issue of how to understand situations in which a theory's rules of rationality are *systematically* disoblged by the reasoning-behavior of actual human beings. Does massive discompliance discredit the theory, or can the theory save itself by invoking its normative authority over human behavior (see chapter 2.5 by Klauer, this handbook)?

There are two different ways of approaching the normativity question, not only in the theory of argument but in all the sciences of both empirically discernible and normatively assessable human behavior. Some hold that normative rules are what the theorists themselves take the *common intuitive* view of them to be (Johnson, 2000). Others hold that rational performance is how the *ideally rational* agent would perform. Typical of these are Bayesian epistemologists, classical decision theorists, and neoclassical economists (see chapter 4.5 by Chater & Oaksford and chapter 9.4 by Dhimi & al-Nowaihi, both in this handbook). Floating in these precincts are ideal norms to which no human being could approximate in any finite degree: one provides that the ideally rational agent closes his beliefs under truth-preserving consequence. Another provides that when an ideally rational decision is taken, the decider has full command of all information of material significance. Neoclassical

economists postulate that an ideally rational economist is subject to the infinite divisibility of her subjective utilities, largely because this enables economics to harness the mathematical firepower of the calculus. In each of these cases, it is put about that any real-life human agent is performing rationally to the extent that he approximates to the ideal norms. So conceived of, the norms are accurate descriptions of how the ideally rational agent performs and an inaccurate description of how we ourselves perform. Even so, the story goes, the empirically false postulates are *normatively* binding upon us. This is not a well-received doctrine in by far most of the sectors of argumentation theory that are reviewed in this note. Of course, this is not to deny the approximable standards of goodness implicit in cognitive practice. For a good review, see the Introduction to this volume by Knauff and Spohn.

3. Toulmin and the Rhetorical Turn

In 1958, persuasion-arguments had a flourishing home in rhetoric but had largely disappeared from logic's theoretical halls.³ This would start to change when Toulmin became aware of speech communication studies and informal logicians became aware of Toulmin.⁴ In the textbooks of the time, natural-language arguments were mainly conceived of in the as-such way. Logic's task was to provide mapping rules⁵ from subsets of real-life arguments to structures of entities constructed from elements of an uninterpreted formal language. Called "logical forms," the idea was that if a property of interest for a natural-language argument—validity, say—could be shown to have a formal counterpart instantiated by the original argument's logical form, then the formal property's natural-language counterpart would also be instantiated there.⁶ This is problematic: it is easily shown that there is no strict one-to-one correspondence between valid natural-language arguments and arguments having a valid logical form in some or other logistic system.⁷ Toulmin made a twofold departure in *The Uses of Argument*. He abandoned the mapping-to-logical-form test for properties of logical interest, and he abandoned the preoccupation with argument as-such and turned toward arguments in-use.

Toulmin is best known for the model of argument that bears his name. Its core idea is that arguing is case-making and that cases are made by human beings for the entertainment and assessment of other human beings. When an argument is under way, its would-be conclusion is a "claim," a proposition on behalf of which a case is being made and whose having been made is a

condition of its meriting acceptance. Claims (C) are supported by "grounds" (G), which take the form of data, facts, or evidence. Grounds answer challenges claims. A "warrant" (W) is a statement that in turn endorses the support rendered by the ground. Claims, grounds, and warrants are necessary conditions for something's being an argument. The next three parameters are discretionary, depending on context. A "backing" (B) lends support to a warrant if it's in doubt. A "rebuttal" (R) is a hedging device, indicating that in default of contrary indications, the backing is secure. A "qualifier" (Q) modifies an arguer's confidence at any given point. When these conditions are met, the first three always and the next three as may be, the arguer has made an argument for his claim. Toulmin's own example of an argument that fits his model can be set out as follows: "Nigel is a British citizen" (C), "Nigel was born in Bermuda" (G), "A person born in Bermuda is a legal citizen of Britain" (W), "Nigel trained as a barrister in London, specializing in citizenship, so he knows that a person born in Bermuda is a legal citizen of Britain" (R). "Unless, that is to say, he has betrayed Britain and spied for another country." Q is a discretionary prefix, attachable as context might indicate.

It is puzzling why warrants don't serve as premisses in the arguments they support. Toulmin concedes that Bermudians are British citizens and Nigel is a Bermudian. He allows that it follows that Nigel is a British citizen, but it follows from "Nigel was born in Bermuda" alone but *not* in the absence of the fact that Bermudans are British citizens. Although Toulmin didn't adequately dig into what brings this to pass, he was on to something important. Not everything necessary for an argument's logical success is suitable for use as a premiss (Carroll, 1895; Ryle, 1950) or, as in some cases, even capable of being *formulated* as one.⁸ The reason why is that background information is often implicit and tacit (Polanyi, 1966; Woods, 2021).

4. Hamblin contra the Logicians

Toulmin was disappointed in the quality of the introductory logic textbooks at midcentury. Twelve years later, the Australian philosopher Charles Hamblin (1970) turned the disappointment into a *scandale*. He scorned the fallacy chapters of the leading texts of the day for their silly and unrealistic examples. The textbooks recycled what their predecessors had to say of the fallacies, as they in turn recycled what their own predecessors said, resulting in a dog's breakfast "so incoherent that we have every reason to look for some enlightenment

at its historical source" (Hamblin, 1970, p. 50). Hamblin follows his own advice with admirable effect. His book *Fallacies* traces the history of fallacy theory from its inception in antiquity, revealing its presence in every succeeding era until its post-Fregean fade-out in the last fifth of the 19th century. The survey shows the adaptability of Aristotelian themes to the freshly arising insights of his successors. *Fallacies* betrays no impatience with formal logic. Hamblin was drawn to a formalized dialectical model of argument and devoted two chapters to it. In so doing, he clearly caught a wave. Formal dialectic was on its way to being a growth industry (see, e.g., Henkin, 1961; Hintikka, 1968; Lorenz, 1961; Lorenzen, 1960; Lorenzen & Lorenz, 1978; Rescher, 1977).

Fallacies had a second and more serious indictment to file: the reason there is no scholarship or depth in those pallid fallacy chapters is that logicians had betrayed their heritage. Aristotle invented their subject and placed the fallacies project at its dead center. But as Hamblin dolefully notes, "We have no *theory* of fallacy at all, in the sense in which we have theories of correct reasoning or inference" (Hamblin, 1970, p. 11). *Fallacies* was a *cri de cœur* for logicians to reattach the fallacies project to logic. Unlike Toulmin, Hamblin wasn't reaching out to the speech communication community. Hamblin was calling upon logicians to produce a thick theory of our mistaking something bad for something good, attended by the means to stop doing it. It is a given that an intellectual instrument purpose-built for the logicism of Frege, Whitehead, and Russell couldn't be of much use in the analysis of *paralogismoi*.⁹ A logician whose only professional interest lay in the foundations of mathematics isn't likely to have much working capital or appetite for fallacy theory. Hamblin is perfectly aware of this. His point is that securing the foundations of arithmetic shouldn't be the sole business of logic.

One of the merits of Hamblin's indispensable book is the care with which it plots the historical course of fallacy theory, and thereby of logic itself, from the 4th century B.C. to the present day. Its author also found space for a chapter on the Indian tradition in logic. A further virtue is the respect it shows medieval contributions to logic, from which Hamblin draws considerable inspiration for his own advances in formal dialectic, in his chapter 8. As already mentioned, Hamblin is in the vanguard of a more general revival of formal dialogue and dialectical logic.¹⁰

It cannot be said that logicians flocked to Hamblin's challenge and still less that he himself produced the theory he called for. I say this notwithstanding the rightful interest that chapter 8 has attracted to the Hamblin

Game H. All the same, from that day to this, not a single article on fallacies has yet appeared in the *Journal of Symbolic Logic*.

5. The Revival of Fallacy Theory

In 1972, there appeared the first of a series of papers by John Woods and Douglas Walton on the fallacies that would extend to the mid-1980s. Woods was a philosophical logician working on the modal character of the entailment relation, and Walton, his former student at the University of Toronto, was an action theorist. In 1971, they were briefly in San Francisco, where they resolved to reserve the next two years to clear up the fallacies and then get back to their other business. Forty-seven years later, they are both still writing about fallacies. Woods and Walton accepted Hamblin's insistence that fallacy theory is the proper business of logic. For each fallacy, they would seek an existing theoretical framework and adapt it to model the logical structure of the fallacy at hand. There was a benign and not uncommon parasitism, mining the tried and true for some not originally intended good. *Fallacies: Selected Papers 1972–1982* (Woods & Walton, 1989/2007) makes selective use of intuitionist, modal, and relatedness logics; causal and epistemic logics; and erotetic (interrogative), deontic, and dialectic logics. The book's chapter 10 shows how a cumulative model of enquiry based on the semantics of Kripke's intuitionist logic can block circular arguments.¹¹ Chapter 8 appropriates Burge's (1977) aggregate theory for the analysis of the composition fallacy. Scattered throughout the book are adaptations of numerous frameworks for dialogue games, some of their own making.¹² Overall, the Woods–Walton Approach (as it came to be called) embodies the maxim that if the foot of a fallacy fits the shoe of a suitably retrofitted logic, then the fallacy should wear it. It is a pluralistic approach eschewing any notion that a beautiful treatment of some one fallacy could be made canonical for how to treat them all. Some critics, notably Rob Grootendorst, protested that on the Woods–Walton Approach (WWA), every fallacy has its own logic. Just so!

In chapter 1 of Woods and Walton's *Selected Papers*, first published in 1972, it was shown that the truth conditions on the logical consequence relation cannot serve as reliable rules of deductive inference.¹³ A running theme of the WWA is that the informal fallacies, if fallacies they be, are not inherently fallacious in virtue of syntactic form. Whether an argument or piece of reasoning is fallacious is always affected by contextual particularities, such as the goal-directedness of its parts. What

is true of the logics of the WWA is true of informal logics across the board: they are practically oriented logics. What the WWA also had, some of the others would reject as overconfidence in the assumption that philosophical treatments of the fallacies are best achieved under the gravitational pull of successful preexisting theories.¹⁴

The Woods–Walton papers were not by any means the only ones of note to appear in the close aftermath of 1970.¹⁵ For a while, the WWA dominated by force of numbers, if not always the press of merit. In time, it would be clear that the greater value of the WWA was the stimulus it provided for further work on fallacious reasoning, some at rather substantial levels.¹⁶ Not the least of these developments are Walton’s 40 or so books either directly on the fallacies or significantly related to them. Since the early days, each of the WWA parties has parted company with their shared model, what with Walton’s circumspect expansions of the pragma-dialectic model (see below) and Woods’s move to a naturalized logic in company with a causal-response epistemological reliabilism (Woods, 2013/2014; chapter 3.2 by O’Brien, this handbook).

6. Informal Logic contra the Textbooks

Toulmin didn’t like the textbooks of the 1950s, and Hamblin abjured the ones of the 1970s. The two leading texts of those times were Irving Copi’s *Introduction to Logic* (1953) and *An Introduction to Logic and Scientific Method*, by Morris Cohen and Ernest Nagel (1934). Neither deserved the scorn that would be heaped upon them, notwithstanding the slightness of their fallacies coverage. In 1971, something consequential happened: Howard Kahane published *Logic and Contemporary Rhetoric*. Spurred by the student-power turbulence of the day, the standard textbooks were scorned for their irrelevance to the current upheavals. Kahane’s book reflected two facts welcomed by its new readers: one was that mainstream symbolic logic had strayed too far from the give-and-take of good and bad reasoning on the ground. The other was that rhetoricians had stayed closer to home and offered a broader, more varied, and more appealing assortment of argument strategies. The relevance revolution was not confined to introductory logic texts,¹⁷ but it was the spur that motivated teachers of introductory courses to write new and more responsive ones. The now-spurned old primers would be placed on their *Index Librorum Prohibitorum*.¹⁸ Correspondingly, teachers of introductory logic courses were motivated to push back against what they rightly saw entirely as the expropriation of logic by mathematicians. The two developments were joined at

the hip, one to “relevantize” the textbooks, the other to “demathematize” logic and restore it to its former primacy in philosophy. Jointly, the two developments marked the birth of late-20th-century informal logic.

Beginning with their *Logical Self-Defence* in 1977, Ralph Johnson, J. Anthony Blair, and their colleagues established at the University of Windsor (Ontario) the organizational and communicational infrastructure for informal logic (IL). In so doing, they displayed an enduring steadfastness and remarkable networking skills. Windsor is home base for triennial meetings of the Ontario Society for the Study of Argumentation and also the place of publication of *Informal Logic*, the journal of record for that subject, and its related monograph series, *Windsor Studies in Argumentation*. Informal logicians have never seen fit to band together and issue manifestos. Windsor is head office infrastructurally but not doctrinally. Perhaps the better part of what explains this openness is that informal logicians tend rather more to agree on what they *don’t* like and rather less on what they *do* like.

One point of near-universal agreement is IL’s hostility to the suggestion conveyed by the textbooks of the day to the effect that first-order mathematical logic gives the best way to represent and evaluate deductively valid inferences as they occur in real life (Govier, 1987; Scriven, 1980). It is strange that on this very point, there is scant reference to Harman (1970). One can also see in the dissatisfactions of 1970 and onward a reaction to the entry of *formal semantics*, in the manner of Tarski, to the philosophy of language. Since language is the principal medium of argument, it is only reasonable to expect that its philosophical theorists would have something insightful to say about it. To put it succinctly, informal logicians were resisting the idea that the best way to construct a philosophical theory of real-life argument is to craft it in the way that Tarski did for the natural-language truth-predicate in “The Concept of Truth in Formalized Languages” (1935/1983), on one reading of which the natural-language predicate “true” comes out as transfinitely ambiguous. In their determination *not* to produce this sort of semantics for the concept of argument, informal logicians do themselves credit in respecting the realities of human speech.

It is virtually impossible to produce a nontrivial overview of the characteristic substance of informal logic, or in what its intellectual distinctiveness lies. Some writers concentrate on the premissory end of argument, others on the conclusion end, and others still on the premiss–conclusion link. Beyond the truisms, there is little by way of solid consensus. For example, Johnson’s and Blair’s criteria for argumental goodness—premiss-acceptability,

premiss–conclusion relevance, and sufficiency of premisses for conclusion-drawing—have had a long play. But, as they say, the devil is in the details, concerning which there are interesting differences of opinion:¹⁹ some informalists see themselves as normative theorists, while others are more interested in descriptive accuracy. Some think that informal logic won't flourish unless it stays on top of developments in epistemology.²⁰ Others insist that the target of good argument is interparty concordance, not knowledge, even if truth might sometimes be a contingent collateral benefit of it.²¹ Further unsettled questions are whether argument and inference are essentially the same, whether argumentation theories should be empirically sensitive, whether arguments are inherently (or even mainly) dialectical—that is, attack-and-defend contests—and whether courses in informal logic enhance one's critical-thinking skills (Blair, 2019). Some emphasize the importance of taking metadialogues and meta-arguments seriously into account (Finocchiaro, 2013; Krabbe, 2003). However, this is not to say that the informal logic idea is beyond informative articulation (see, e.g., Hitchcock, 2007; Johnson, 1996).

7. Pragma-Dialectics

If informal logic carries a nominal Canadian identity, pragma-dialectics (PD) has a more substantial Dutch one. It began with van Eemeren and Grootendorst (1984) as a simplified version of the sort of theory advanced in Barth and Krabbe (1982), a difficult and mathematically sophisticated book entitled *From Axiom to Dialogue*. The pragma-dialectical book—*Speech Acts in Argumentative Discussion*—reflected the authors' confidence that conflict-resolution arguments could successfully be modeled without the encumbrance of complex mathematicized formalisms. The counterpart city to Windsor is Amsterdam: it is the conference home of the International Society for the Study of Argumentation (ISSA) and of the journal of record *Argumentation* and its related monograph series. People who work in informal logic tend to have more arrows in their quiver than the Amsterdamers do. While many informal logicians write about other things,²² pragma-dialectics is the sole preoccupation of those who espouse it. While it is true that there is no party line in *Argumentation*—the Amsterdam journal—the same is not true of its practitioners. I have sometimes heard it bruited in Amsterdam that there is a reason for this difference: the pragma-dialectical approach has produced a canonical theory, and the informal logic approach has not. It takes at least two conditions for a theory to achieve canonical status: it must

stand tall in the marketplace of ideas, and it must have a large, durable, and approving readership. There are certainly widely acclaimed individuals in the IL community, and some of their views have had more staying power than others. True, but the PD theory is a *house-brand*, and nothing in IL is quite that.

The PD theory has two main parts: the first is a normative theory of critical discussions furnished by an ideal model of them. The second part of the PD theory incorporates, under the heading “strategic maneuvering,” features derived from rhetoric and designed to make critical discussions persuasive. I'll sketch the first and most central part of the theory, beginning with the 10 critical discussion rules. The first thing to note is a change in the meaning of “fallacy.” A fallacy is now conceived of as *any* violation of the discussion rules.

Paraphrasing van Eemeren, Grootendorst, and Snoeck Henkemans (2002), the rules can be paraphrased as follows:

- Parties are free to advance standpoints and also to challenge them.
- The burden of proof should lie on him who has advanced the standpoint.
- Attack- and defend-arguments must be on topic.
- Parties must not deny their own unexpressed premisses or misattribute an unexpressed premiss to the other.
- Parties must not use premisses not accepted by the other party or deny a premiss accepted by their interlocutors.
- The only conclusive defense of a challenged standpoint is by way of an appropriate argumentation scheme correctly applied.
- An argument is conclusive only if it is valid or can be made so by the explicitization of implicit premisses.
- If a defense fails, it must be withdrawn, and if it succeeds, the challenge must be retracted.
- Moreover, parties must not speak in an unclear or confusing manner and must try to interpret one another fairly.

The rules themselves jointly constitute a standpoint. It is disputed whether it satisfies its own rule 9.

The PD approach has its critics, of course. Here are some of the main misgivings: (1) It is not clear whether the rules biconditionally define the PD's own concept of “critical discussion.” (2) If they do, it is not clear whether, or to what extent, the PD model is actually *instantiated* in conversationally expressed differences of opinion in real life. (3) If the theory is empirically inadequate, it is

not clear whether it could be saved. (4) Could it be saved by its status in an *ideal model*? (5) Could it be saved by the ideal model's *normative authority*? (6) The deductivist validity condition is problematic: *any* invalid argument can be validated by adding as a premiss a conditional whose antecedents are its other premisses and whose conclusion is its conclusion. (7) Finally, how well does the model “travel”? Concerning this last question, it is put about that the PD model is effective in the analysis and evaluation of collective-bargaining treaty negotiation, parliamentary debates, political arguments, arguments about health policy, and visual argumentation. I am bound to say in reply that, however questions (1) to (6) are to be answered, in all good conscience the answer to (7) must be that it doesn't travel especially well.

Like all those in the reference class of this note, invocations of idealized normative models leave two critical chores undone: one is to specify the conditions under which an account of something of a kind *K* is a “model” of its behavioral instantiations. Second, what makes the model an “idealization” of *K*'s behavioral instantiations? Wherein lies its “normative authority” to bind in our own behavioral instantiations of *K*? For a thorough and carefully balanced view of these and related matters, one could do no better than consult Blair (2012, chapter 20).

This leaves the question, Why does the PD approach have such appeal? A pair of answers come to mind. The less serious one is this: it is said in Windsor and other like places that the appeal of the PD approach lies in its *easiness*. The more serious answer is that the PD approach's underlying pragma-dialectical character reflects some key truths about how human beings advance their views in reason-giving ways, for the consideration of other humans who think otherwise. If Blair is right, the difficulties with the PD approach might derive from its own *theoretical handling* of the underlying idea. If so, it could be that its supporters are rather more approving of the idea than of the theory.

8. More Recent Developments

Developments of importance include the expanding migration of argumentation theory to the analysis and evaluation of legal reasoning (Feteris, 1999; Prakken, 1997; Sartor, 1995; Walton, 2002; Woods, 2015/2018; Zenker, Dahlman, Bååth, & Sarwar, 2015), a renewed interest in argument by mathematical logicians (Barringer, Gabbay, & Woods, 2012; Gabbay, 2013; van Benthem, 2011), an enlarging rapprochement between logic and psychology (Oaksford & Chater, 2007; Paglieri, Bonelli, & Felletti, 2016; chapter 5.5 by Hahn &

Collins and chapter 5.4 by Gazzo Castañeda & Knauff, both in this handbook), and the hook-up between the argumentation schemes literature, on the one hand, and software engineering and AI, on the other. We also see in this alliance an interesting overlap with legal argumentation (Verheij, 2003): initially introduced by Perelman and Olbrechts-Tyteca (1958) and Hastings (1962), an argumentation scheme is a pattern of reasoning in everyday kinds of argument, adjoined to which are questions designed to facilitate the evaluation of arguments thus configured. For example, are the premisses accurate? Are there some unexpressed but load-bearing premisses? Might there be some allowable exceptions?²³ Under what assumption would the scheme in question intelligibly be construed as a successful form of argument? Would a reasonable answer to that question make it defeasibly reasonable to regard the assumption as provisionally true?²⁴

Argumentation Schemes for Presumptive Reasoning (Walton, 1996) reveals a preoccupation with presumption. Walton tends to identify presumptive reasoning with defeasible reasoning. Some say that neither is, strictly speaking, a species of the genus “reasoning.” A piece of reasoning is defeasible just because it doesn't close the world and therefore lies open to the possibility of defeat or weakening. Presumption—some say—is no kind of reasoning at all but rather a reasoner's disposition to view defeating conditions as surprising. In many of these patterns of fallacious argument, the questions they raise are thought to be helpful in distinguishing the fallacious from the nonfallacious. For Walton (2013), “a fallacy is an argument, a pattern of argumentation, or something that purports to be an argument, that falls short of some standard of correctness as used in a conversational context and poses a serious obstacle to the realization of the goal of the dialogue” (p. 215). In essence, his is the PD conception. Walton's further purpose was to show how argument schemes can help students in analyzing and judging arguments. In Walton (1996), there are 29 such schemes, but in Walton, Reed, and Macagno (2008), the list has swollen to 96, a daunting concordance for a student to keep on top of but no chore at all for a computer. It is ample evidence of Walton's penchant for a pluralism that gives a multitude of different ways for something to be a fallacy, no fewer than the number of a scheme's rules times 96.

Computer modeling presents all theorists of empirically discernible and normatively assessable behavior with interesting challenges. If the theorist in question seeks computer models of his account, he'll have to formulate them in a way that enables the software engineer to get

hold of them. The argumentation schemes approach has had substantial appeal for AI engineers whose goal is to model them in ways that assist with “argument-mining” and multiagent analysis. This is brought about by feeding in answers to the questions raised by a scheme as further premisses of defeasible arguments now made valid by the additions. Notwithstanding the formidable reach of computer modeling, it is virtually impossible to bring off until data sets are suitably massaged for computational grasp. In so saying, we are back where we started. What wears the trousers here? The data or the mathematical models that seek them out?

I close with a remark from Christopher Tindale’s Introduction to Blair (2012, p. xiv). Although specifically about Walton, it applies equally to the argument schemes approach in general:

In the review of Walton he asks some fundamental questions of argumentation schemes: from where do they come, and from where do they derive their probative force? The origins of the Walton list had not been clear, and their cogency had been taken for granted by a number of theorists. But not by Blair. In similar fashion, he challenges the critical questions that accompany the schemes. What motivates these questions, and how do we know when a list is complete?

Acknowledgments

Thanks to Tony Blair and Erik Krabbe for helpful information and constructive suggestions and especially to my patient editor Wolfgang Spohn for his help in shrinking this note to within striking distance of the required word count. Blair was one of this submission’s reviewers; he offered three suggestions, all of them adopted for the better.

Notes

1. A property is semi-decidable in a theory just in case there is a finitary algorithmic procedure for determining that something has it if indeed it does have it.
2. Roughly speaking a theory is of first order just in case its sole objects of reference are individuals. In a second-order theory, both individuals and properties or classes are objects of reference.
3. A still-influential work of that same year is Perelman and Olbrechts-Tyteca (1958).
4. Toulmin (1958), with Brockriede and Ehninger (1960) responding and Toulmin, Rieke, and Janik (1979) responding in turn.
5. Also mistakenly called “rules of translation.”
6. Think also of entailment, deducibility, consistency, provability, equivalence, and interdeducibility.

7. Consider, for example, the valid argument, “The shirt is red, so the shirt is colored.” There is no logistic system in which it maps to a valid form.

8. For example, is memory or background information helpful, even when not decomposable into well-individuated propositionally expressible units?

9. Logicism is the doctrine according to which every theorem of arithmetic is provable from the laws of symbolic logic.

10. In some of the more highly formalized ones, decidability and semi-decidability proofs are an intelligible, and sometimes even attainable, objective (van Benthem, 2011).

11. Cumulative models preclude the retraction of answers in a question-and-answer game. The preclusion originated in Aristotle’s treatment of refutation arguments.

12. For example, Circle Games, DD games, and the so-called Woods–Walton fragment.

13. *In medias res*, they were made aware that the same point had been made in Harman (1970).

14. See, for example, Rescher (1976).

15. See, for example, Massey (1975), Broyles (1975), Barker (1976), and Mackenzie (1979).

16. Later works of note include Walton (1984), Govier (1987), van Eemeren and Grootendorst (1992), Hansen and Pinto (1995), Johnson (2000), and Tindale (2007). See also the papers in Hitchcock (2017), Blair (2012), and Wohlrapp (2014). Also important is Plantin (2018).

17. The student-power movement of the time rewrote university governance policies throughout the Western world.

18. Oddly enough, the dismissal didn’t stop informal logicians, especially in the early decades, from mining the indexed books to motivate their theories. As one critic observed, “Pretty low-hanging fruit!”

19. For premiss adequacy, see Freeman (2005). For relevance, see Gabbay and Woods (2003) and Walton (2004). For premiss sufficiency, see Woods (2013/2014, chapter 7).

20. Plumping for the justified-true-belief model of knowledge are Biro and Siegel (1992) and Freeman (2005). Plumping for the causal-response model of reliabilism is Woods (2013/2014). See also chapter 3.2 by O’Brien (this handbook).

21. See here van Eemeren and Grootendorst (2004). Essential counterreading is Blair (2012, chapter 20).

22. For example, Finocchiaro on Galileo, Siegel on scientific relativism, Walton on courage, Barth on Quisling, Govier on peace, and Woods on bioethics.

23. Schemes are prefigured as *topica* in Aristotle’s monograph of that same name.

24. See also Hitchcock (2017, chapter 14), Rawman and Reed (2009), and Wyner (2016).

References

- Barker, J. A. (1976). The fallacy of begging the question. *Dialectica*, 15, 241–255.
- Barringer, H., Gabbay, D. M., & Woods, J. (2012). Temporal argumentation networks. *Argument & Computation*, 2–3, 143–202.
- Barth, E. M., & Krabbe, E. C. (1982). *From axiom to dialogue: A philosophical study of logics and argumentation*. Berlin, Germany: De Gruyter.
- Biro, J., & Siegel, H. (1992). Normativity, argumentation and an epistemic theory of fallacies. In F. H. van Eemeren, R. Grootendorst, J. A. Blair, & Willard, C. A. (Eds.), *Proceedings of the Second International Conference on Argumentation* (pp. 330–337). Amsterdam, Netherlands: SicSat.
- Blair, J. A. (2012). *Groundwork in the theory of argumentation: Selected papers of J. Anthony Blair*. Dordrecht, Netherlands: Springer.
- Blair, J. A. (Ed.). (2019). *Studies in critical thinking*. Windsor, Ontario, Canada: WSIA (Windsor Studies in Argumentation).
- Broyles, J. E. (1975). The fallacies of composition and division. *Philosophy & Rhetoric*, 8, 108–113.
- Burge, T. (1977). A theory of aggregates. *Noûs*, 11, 97–118.
- Carroll, L. (1895). What the Tortoise said to Achilles. *Mind*, 4, 278–280.
- Cohen, M. R., & Nagel, E. (1934). *An introduction to logic and scientific method*. New York, NY: Harcourt, Brace.
- Copi, I. M. (1953). *Introduction to logic*. New York, NY: Macmillan.
- Corcoran, J. (1972). Completeness of an ancient logic. *Journal of Symbolic Logic*, 37, 696–702.
- Feteris, E. T. (1999). *Fundamentals of legal argumentation*. Dordrecht, Netherlands: Springer.
- Finocchiaro, M. A. (2013). *Meta-argumentation: An approach to logic and argumentation theory* (Studies in Logic, Vol. 42). London, England: College Publications.
- Freeman, J. P. (2005). *Acceptable premises: An epistemic approach to an informal logic problem*. New York, NY: Cambridge University Press.
- Frege, G. (1950). *The foundations of arithmetic: A logico-mathematical enquiry into the concept of number* (J. L. Austin, Trans.). Oxford, England: Blackwell. (Original work published 1884)
- Gabbay, D. M. (2013). *Meta-logical investigations in argumentation networks* (Studies in Logic, Vol. 44). London, England: College Publications.
- Gabbay, D. M., & Woods, J. (2003). *A practical logic of cognitive systems: Vol. 1. Agenda relevance: A study in formal pragmatics*. Amsterdam, Netherlands: North Holland.
- Gabbay, D. M., & Woods, J. (2005). *A practical logic of cognitive systems: Vol. 2. The reach of abduction: Insight and trial*. Amsterdam, Netherlands: North-Holland.
- Govier, T. (1987). *Problems in argument analysis and evaluation*. Dordrecht, Netherlands: Foris.
- Hamblin, C. L. (1970). *Fallacies*. London, England: Methuen.
- Hansen, H. V., & Pinto, R. C. (1995). *Fallacies: Classical and contemporary readings*. University Park: Pennsylvania State University Press.
- Harman, G. H. (1970). Induction: A discussion of the relevance of the theory of knowledge to the theory of induction (with a digression to the effect that neither deductive logic nor the probability calculus has anything to do with inference). In M. Swain (Ed.), *Induction, acceptance, and rational belief* (pp. 83–99). Dordrecht, Netherlands: Reidel.
- Hastings, A. C. (1962). *A reformulation of the modes of reasoning in argumentation* (Unpublished doctoral dissertation). Northwestern University, Evanston, IL.
- Henkin, L. (1961). Some remarks on infinitely long formulas. In *Infinitistic methods: Proceedings of the Symposium on Foundations of Mathematics, Warsaw, 2–9 September 1959* (pp. 167–183). Oxford, England: Pergamon Press.
- Hintikka, J. (1968). Language games for quantifiers. In N. Rescher (Ed.), *Studies in logical theory* (pp. 46–72). Oxford, England: Blackwell.
- Hitchcock, D. (2007). Informal logic and the concept of argument. In D. Jacquette (Ed.), *Philosophy of logic*, Vol. 5 of D. M. Gabbay & J. Woods (Eds.), *Handbook of the philosophy of science* (pp. 101–129). Amsterdam, Netherlands: Elsevier.
- Hitchcock, D. (2017). *On reasoning and argument: Essays in informal logic and on critical thinking*. Cham, Switzerland: Springer.
- Johnson, R. H. (1996). *The rise of informal logic: Essays on argumentation, critical thinking, reasoning and politics*. Newport News, VA: Vale Press.
- Johnson, R. H. (2000). *Manifest rationality: A pragmatic theory of argument*. Mahwah, NJ: Erlbaum.
- Johnson, R. H., & Blair, J. A. (1977). *Logical self-defense*. Toronto, Ontario, Canada: McGraw-Hill.
- Kahane, H. (1971). *Logic and contemporary rhetoric*. Belmont, CA: Wadsworth.
- Krabbe, E. C. W. (2003). Metadialogues. In F. H. van Eemeren, J. A. Blair, C. A. Willard, & A. F. Snoeck Henkemans (Eds.), *Anyone who has a view* (pp. 641–644). Dordrecht, Netherlands: Kluwer.
- Lorenz, K. (1961). *Arithmetik und Logik als Spiele* [Arithmetic and logic as games] (Unpublished doctoral dissertation). Christian-Albrechts-Universität Kiel, Germany.

- Lorenzen, P. (1960). Logik und Agon [Logic and agon]. In *Atti del XII Congresso Internazionale di Filosofia (Venezia, 12–18 Settembre 1958)* (Vol. 4, pp. 187–194). Florence, Italy: Sansoni.
- Lorenzen, P., & Lorenz, K. (1978). *Dialogische Logik* [Dialogical logic]. Darmstadt, Germany: Wissenschaftliche Buchgesellschaft.
- Mackenzie, J. D. (1979). Question-begging in non-cumulative systems. *Journal of Philosophical Logic*, 8, 117–133.
- Massey, G. J. (1975). Are there good arguments that bad arguments are bad? *Philosophy in Context*, 4, 61–77.
- Mercier, H., & Sperber, D. (2017). *Enigmas of reason*. Cambridge, MA: Harvard University Press.
- Oaksford, M., & Chater, N. (2007). *Bayesian rationality: The probabilistic approach to human reasoning*. Oxford, England: Oxford University Press.
- Paglieri, F., Bonelli, L., & Felletti, S. (Eds.). (2016). *The psychology of argument: Cognitive approaches to argumentation and persuasion*. London, England: College Publications.
- Perelman, C., & Olbrechts-Tyteca, L. (1958). *La nouvelle rhétorique: Traité de l'argumentation* [The new rhetoric: Treatise on argumentation]. Paris: Presses Universitaires de France.
- Pinto, R. C. (1995). *Argument, inference and dialectic*. Dordrecht, Netherlands: Kluwer.
- Plantin, C. (2018). *Dictionary of argumentation*. London, England: College Publications.
- Polanyi, M. (1966). *The tacit dimension*. Garden City, NY: Doubleday.
- Prakken, H. (1997). *Logical tools for modelling legal argument: A study of defeasible reasoning in law*. Dordrecht, Netherlands: Kluwer.
- Rahwan, I., & Reed, C. (2009). The argument interchange format. In I. Rahwan & G. R. Simari (Eds.), *Argumentation in artificial intelligence* (pp. 383–402). Boston, MA: Springer.
- Rescher, N. (1976). *Plausible reasoning*. Assen, Netherlands: Van Gorcum.
- Rescher, N. (1977). *Dialectics: A controversy-oriented approach to the theory of knowledge*. Albany: State University of New York Press.
- Ryle, G. (1950). 'If,' 'so,' and 'because.' In M. Black (Ed.), *Philosophical analysis* (pp. 323–340). Ithaca, NY: Cornell University Press.
- Sartor, G. (1995). Defeasibility in legal reasoning. In Z. Bankowski, I. White, & U. Hahn (Eds.), *Informatics and the foundations of legal reasoning* (Law and Philosophy Library, Vol. 21, pp. 119–157). Dordrecht, Netherlands: Springer.
- Scriven, M. J. (1980). The philosophical and practical significance of informal logic. In J. A. Blair & R. H. Johnson (Eds.), *Informal logic, the first international symposium* (pp. 147–160). Inverness, CA: Edgepress.
- Tarski, A. (1983). The concept of truth in formalized languages. In A. Tarski, *Logic, semantics, metamathematics: Papers from 1923 to 1938* (J. Corcoran, Ed.; 2nd ed., pp. 152–278). Indianapolis, IN: Hackett. (Original work published 1935)
- Tindale, C. W. (2007). *Fallacies and argument appraisal*. Cambridge, England: Cambridge University Press.
- Toulmin, S. E. (1958). *The uses of argument*. Cambridge, England: Cambridge University Press.
- Toulmin, S. E., Rieke, R., & Janik, A. (1979). *An introduction to reasoning*. New York, NY: Macmillan.
- van Benthem, J. (2011). *Logical dynamics of information and interaction*. New York, NY: Cambridge University Press.
- van Eemeren, F. H., & Grootendorst, R. (1984). *Speech acts in argumentative discussions: A theoretical model for the analysis of discussions directed towards solving conflicts of opinion*. Dordrecht, Netherlands: Foris.
- van Eemeren, F. H., & Grootendorst, R. (1992). *Argumentation, communication and fallacies: A pragma-dialectical perspective*. Hillsdale, NJ: Erlbaum.
- van Eemeren, F. H., & Grootendorst, R. (2004). *A systematic theory of argumentation: The pragma-dialectical approach*. Cambridge, England: Cambridge University Press.
- van Eemeren, F. H., Grootendorst, R., & Snoeck Henkemans, A. F. (2002). *Argumentation: Analysis, evaluation, presentation*. Mahwah, NJ: Erlbaum.
- Verheij, B. (2003). Dialectical argumentation with argumentation schemes: An approach to legal logic. *Artificial Intelligence and Law*, 11, 167–195.
- Walton, D. N. (1984). *Logical dialogue games and fallacies*. Lanham, MD: University Press of America.
- Walton, D. N. (1996). *Argumentation schemes for presumptive reasoning*. Mahwah, NJ: Erlbaum.
- Walton, D. N. (2002). *Legal argumentation and evidence*. University Park: Pennsylvania State University Press.
- Walton, D. (2004). *Relevance in argumentation*. Mahwah, NJ: Erlbaum.
- Walton, D. (2013). *Methods of argument*. New York, NY: Cambridge University Press.
- Walton, D., Reed, C., & Macagno, F. (2008). *Argumentation schemes*. Cambridge, England: Cambridge University Press.
- Wohlrapp, H. R. (2014). *The concept of argument: A philosophical foundation*. Dordrecht, Netherlands: Springer. (Original work published 2008)
- Woods, J. (2011). Whither consequence? *Informal Logic*, 31, 318–343.

Woods, J. (2013). *Errors of reasoning: Naturalizing the logic of inference* (Studies in Logic, Vol. 45). London, England: College Publications. (Reprinted with corrections in 2014)

Woods, J. (2014). *Aristotle's earlier logic* (2nd rev. ed.). Paris, France: ISTE/Hermes Science. (Original work published 2001)

Woods, J. (2015). *Is legal reasoning irrational? An introduction to the epistemology of law* (Law and Society, Vol. 2). London, England: College Publications. (Reprinted with corrections in 2018)

Woods, J. (2021). Four grades of ignorance-involvement and how they nourish the cognitive economy. *Synthese*, 198, 3339–3368.

Woods, J., & Walton, D. (2007). *Fallacies: Selected papers 1972–1982*. London, England: College Publications 2007. (Original work published 1989)

Wyner, A. (2016). A functional perspective on argumentation schemes. *Argument and Computation*, 7, 113–133.

Zenker, F., Dahlman, C., Bååth, R., & Sarwar, F. (2015). Giving reasons *pro et contra* as a debiasing technique in legal decision making. In D. Mohammed & M. Lewinski (Eds.), *Proceedings of the First European Conference on Argumentation* (pp. 807–820). London, England: College Publications.

This is a section of [doi:10.7551/mitpress/11252.001.0001](https://doi.org/10.7551/mitpress/11252.001.0001)

The Handbook of Rationality

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Citation:

The Handbook of Rationality

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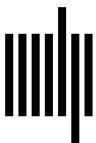
DOI: 10.7551/mitpress/11252.001.0001

ISBN (electronic): 9780262366175

Publisher: The MIT Press

Published: 2021

Funding for the open access edition was provided by the MIT Libraries Open Monograph Fund.



The MIT Press

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The MIT Press would like to thank the anonymous peer reviewers who provided comments on drafts of this book. The generous work of academic experts is essential for establishing the authority and quality of our publications. We acknowledge with gratitude the contributions of these otherwise uncredited readers.

This book was set in Stone Serif and Stone Sans by Westchester Publishing Services.

Library of Congress Cataloging-in-Publication Data

Names: Knauff, Markus, editor. | Spohn, Wolfgang, editor.

Title: The handbook of rationality / edited by Markus Knauff and Wolfgang Spohn.

Description: Cambridge : The MIT Press, 2021. | Includes bibliographical references and index.

Identifiers: LCCN 2020048455 | ISBN 9780262045070 (hardcover)

Subjects: LCSH: Reasoning (Psychology) | Reason. | Cognitive psychology. | Logic. | Philosophy of mind.

Classification: LCC BF442 .H36 2021 | DDC 153.4/3—dc23

LC record available at <https://lcn.loc.gov/2020048455>