Commentary on: J.A. Blair's "The 'logic' of informal logic"

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1. INTRODUCTION

Tony Blair has produced a very useful review of forms of good premiss-conclusion linkage other than deductive validity and inductive strength that have been recognized and appropriated within the field of informal logic over the past 30 years. His paper will be a useful reference.

I would like to begin my comments on his paper by registering my agreement with the fundamentals of his approach. First, although Blair correctly distinguishes reasoning from argument, he rightly notes that the novel forms of good linkage apply equally well to both. The standards for good inference in one's own reasoning seem to be the same as the standards for good inference in arguments addressed to others, perhaps because in both cases the question is the same: do the reasons that serve as the basis transmit the appropriate kind of acceptability to the upshot? Second, at the highest level of generality, the distinctions between induction, deduction and other forms of "duction" are distinctions between different kinds of good linkage, not between different kinds of reasoning or different kinds of argument. Reasoning and argument do not come labelled as 'deductive' or 'inductive', and it is often a matter of decision by an evaluator which standard of inference appraisal to apply, as Robert Ennis has recently argued (Ennis, 2001). At lower levels of generality, however, we are dealing with argument schemes or reasoning schemes, such as inductive generalization, reasoning by analogy, conductive or pros-and-cons reasoning, means-end reasoning, interpretation of a quoted passage, inference to the best explanation, and so forth. (Walton, 1996) has presented a long list of such argument schemes as appraisable by a presumptive or defeasible standard of inference appraisal. But in fact some of these schemes have instances that meet a variety of standards. An argument by analogy based on a tight determination relation, such as the rule that the first letter of the postal code of a Canadian address determines the province in which the address is located, has a conclusive inference. One based on a loose determination relation, such as the causal relationship between various features of a house and its current market value, has a non-conclusive inference, which in the case of a competent real estate appraisal would support a judgment that the current market value of the property being appraised is probably within a specified range. An argument by parallels of the sort to which John Wisdom draws our attention in his *Proof and Explanation* (Wisdom, 1991) creates in the best case a presumption that its conclusion is to be accepted. Thus there is no single standard of inference appraisal appropriate to all arguments by analogy, if arguments by analogy are defined in the most general way as arguments that project a queried property from analogue cases to a target on the basis of properties that they are assumed to have in common. The same is true of other argument schemes.

Having registered my agreement with Blair's basic framework, except for the caveat about argument schemes, I would like to lodge an objection to the presupposition of his title, that informal logic has its own distinctive logic. As Blair himself has stated, in a paper co-authored with Ralph Johnson, informal logic "is best understood as the normative study of argument. It is the area of logic which seeks to develop standards, criteria and procedures for the interpretation, evaluation and construction of arguments and argumentation used in natural language." (Blair & Johnson, 1987, p.148; similarly, Johnson & Blair, 2000, p. 94) Blair's present paper comes under the heading of standards and criteria for the evaluation of arguments used in natural language. Such standards will obviously include those developed in the logical tradition of the last 2,400 years. We should not expect informal logic to ignore work already done on what constitutes a good inference. Nor should we necessarily expect amendment or supplementation of this tradition to come from scholars who identify themselves as members of the informal logic community. In fact, of the six thinkers whose innovations Blair reviews, only one considered himself to be working in the field of informal logic when he introduced his innovation: Douglas Walton. And Walton's work on presumptive reasoning, as he and Blair acknowledge, is largely derivative from the work of Pollock and of artificial intelligence researchers like Reiter on defeasible reasoning. Given this track record, we should not expect research in the field of informal logic to produce innovations about premiss-conclusion linkage. Nor should we expect it to develop proof systems for non-conclusive consequence relations, with accompanying metatheorems concerning the soundness, completeness, decidability and other properties of such systems. There is a need for such developments, but they are the business of formal logic, not of informal logic.

Blair's paper raises many interesting questions. I shall discuss only two of them. First, how are we to classify the ways in which an upshot can be legitimately inferred from a basis? Second, what can be said to supplement Blair's brief characterization of deductive validity and inductive strength?

2. KINDS OF "DUCTION"

Given the recognition in the logical tradition of deduction, induction, abduction and conduction as distinct forms of legitimate inference, it is useful to coin the word 'duction' (from the Latin *ductio*, meaning 'a leading') as the name of the genus of which these forms are species, or perhaps sub-species. As I shall use the word, a duction is a legitimate way of inferring an upshot from a basis. If the neologism is opaque, one could instead call the genus 'followings' and think of the species as ways of following.

How shall we divide the genus of duction or following?

We should not expect, I think, a tree of Porphyry, with a cut at each division into a set of mutually exclusive and jointly exhaustive species, proceeding steadily and gracefully to the infimae species that cannot be further divided. For there are various bases on which ductions can be divided, and these bases cut across one another. One basis of division is the formality or non-formality of the duction. A formal duction is a way of following that can be brought under a rule of inference that is purely formal, in the sense that its statement consists entirely of logical expressions. For example, formal deductive validity, if defined with reference to a formal language, is the property of an argument that it has no counter-model, i.e. no interpretation of its extra-logical constants in which the basis is true and the upshot not true. (Formal validity can be defined for natural-language arguments in terms of their symbolizability by a formally valid argument in a formal language.) Note that not all formal ductions are deductive. Inferences in accordance with Bayes' theorem are formal but non-deductive. Non-formal ductions cannot be brought under a formal rule of inference, but can be brought under one that is material, in the sense that its statement contains at least one expression that is not logical. In contemporary philosophical logic, material consequence seems to be defined as a relationship dependent on the meaning of the basis and the upshot, as in such simple examples as 'Jones is a bachelor, so Jones is male'. But one can allow ductions in which the non-formal generalization that licenses the inference is not a conceptual truth but a substantive generalization, as in the argument 'This object is made of wood, so it will float in water'. In this example, the inference-licensing generalization that objects made of wood float in water is a nomic (law-like) generalization that supports counter-factual conditionals ('if this wooden object were put in water, it would float'). But even purely accidental generalizations can license inferences; for example, it follows from the fact that Abraham Lincoln was president of the United States that he was a man, since all U.S. presidents to date have been men. But the counter-factual conditional that, if Walter Mondale had been elected president of the United States in 1984 and had died in office, being succeeded to the office by his vice-presidential running mate Geraldine Ferraro, then Geraldine Ferraro would have been a man, is obviously false.

Another basis for distinguishing ductions, cutting across that according to their formality or non-formality, has to do with their defeasibility status. Pollock, for example, distinguishes conclusive ductions from defeasible ductions. On the usual understanding, all inferences licensed by exceptionless generalizations—whether they are logical, conceptual, nomic or accidental—are conclusive, and thus non-defeasible. But connectionist scruples can generate kinds of conclusive duction that cannot be rebutted (i.e. shown to be false in a way consistent with the truth of the premisses) but can be undermined. According to one connectionist conception of conclusive duction (Hitchcock, 1998), an upshot follows conclusively from a given basis if and only if there is some general feature of the argument from the basis to the upshot rules out that the basis is true while the upshot is not true, even though it does not rule out the basis is true and does not rule out that the upshot is not true. The latter qualifications are designed to rule out trivial ways of satisfying the requirement for conclusive duction, for example by the basis having a general feature that rules out its truth (e.g. 'Socrates is an immortal human, so all wine is sweet') or the upshot having a general feature that rules out its falsehood (e.g. 'Wine is wine, because Socrates was an Athenian'). A consequence of the rejection of trivial conclusive duction is that additional information can undermine an otherwise conclusive inference. For example, it follows from the premiss that a certain tree is a pine that it is a conifer. But if one adds to the basis the additional information that it is not a pine (thus producing an inconsistent database), the proposition that the tree is a conifer no longer follows, for any general feature that rules out the basis is true while the upshot is not true also rules out that the basis is true. The new information of course does not show that the conclusion is false; it merely undermines the inference. If we recognize ductions that are conclusive but underminable, then the basic division along the axis of defeasibility is between rebuttable and non-rebuttable ductions. A rebuttable duction is subject to a rebutting (or, in Pinto's happy phrase, "overriding"—Pinto, 2001, pp. 102-103) defeater, a circumstance in which the basis remains true but the output is not true. Rebuttable ductions are those for which it is appropriate to qualify the conclusion with a word like 'probably', 'presumably' or 'possibly'. We could thus divide rebuttable ways of following into those that make the upshot probable given the truth of the basis, those that create a presumption of its acceptability given the truth of the upshot, and those that establish its worthiness to be given serious consideration given the truth of the upshot. There might be other ways of following coordinate with these three, and each of them might be divisible into sub-species.

3. DEDUCTION AND INDUCTION

Blair assumes that deductive validity and inductive strength are two ways in which an illative move from some "basis" to its "upshot" can be good. But both these concepts are more problematic than he acknowledges.

He glosses deductive validity, labeled as "entailment" of the upshot by the basis, as the impossibility of the upshot's being false if the basis is true. The gloss raises a number of questions, which are independent of Blair's additional requirement for a good deductive illative move that the basis is different from the upshot. First, Blair's gloss presupposes that both the upshot and the basis are truth-bearers, but some recent work (e.g. Pinto, 2006; Ennis, 2006) has questioned this presupposition, and proposed instead that the upshot is an entitlement with respect to a truth-bearer (or, in the case of reasoning, the mental analogue of an illocutionary act which the reasoning entitles one to perform). If this proposal is accepted, some modification to the conceptualization of deductive validity will be required. Second, the gloss needs clarification of what meaning the word 'if' has in this context. If it is construed truth-functionally, then it follows that any illative move to an upshot that cannot be false is a good one, for example, the move from 'Pluto is a planet' to '2 + 2 = 4'. It also follows that any illative move from a basis that cannot be true is a good one, for example, the move from 'you are sitting and you are not sitting' to 'Tom is in the corner'. There is a long history of skepticism about whether such illative moves from a completely irrelevant basis are really good, skepticism that has produced for example the work of C. I. Lewis on strict implication (Lewis, 1918, 1920) Anderson and Belnap's conceptualization of relevant entailment (Anderson & Belnap, 1975; Anderson, Belnap, & Dunn, 1992), and Neil Tennant's classical and intuitionist relevant logics (Tennant, 1987). Relevantists (e.g. Read, 1988) tend to describe entailment as the impossibility of the upshot's being false *while* the basis is true. Third, the gloss needs clarification of what sort of impossibility is intended. If it is logical impossibility, then some clarification of what constitutes logical impossibility is required. If deductive validity is to include not just logical or formal validity but also what some have called 'semantic validity' or 'material validity' (Brandom, 1998, 2001), then a broader sense of impossibility is needed. One way to clarify this sense is to appeal to the meaning of the basis and the upshot (assuming that these are linguistic items, not the semantic correlates of linguistic items) as that which rules out the situation that the basis is true and the upshot false. Such a clarification gives rise to further difficulties in determining what counts as part of the meaning and what counts as a substantive claim—for example, whether ‘water’ by definition means a chemical compound whose molecules each consist of two atoms of hydrogen and one atom of oxygen. One could accommodate all three of the concerns that I have just mentioned by rephrasing Blair’s gloss on the concept of deductive validity as follows: the meaning of the basis and the upshot rules out in a non-trivial way that the truth-bearing content of the basis is true while the truth-bearing content of the upshot false. In this gloss, the phrase ‘in a non-trivial way’ needs further explication. If the meaning of the basis does not rule out that its truth-bearing content is true and the meaning of the upshot does not rule out that its truth-bearing content is false, then non-triviality is guaranteed. A more complicated explication is needed to allow for relevant deduction from a basis whose truth-bearing content cannot be true or to an upshot whose truth-bearing content cannot be false. A fourth question about Blair’s gloss concerns illative moves where the upshot or basis does not involve a commitment to the truth of a truth-bearer, for example moves from a conditional command and the satisfaction of its condition to an unconditional command. Such moves can perhaps be brought under a general conception of entailment by considering their alethic analogues, such as the move from a conditional ought statement and the satisfaction of its condition to an unconditional ought statement.

As to inductive strength, Blair glosses this as “the quantifiable degree that the basis makes it probable that the upshot is true or worthy of acceptance”. This gloss avoids many of the problems of his gloss of deductive validity. The phrase “makes it probable” rules out trivial satisfaction of the definition by the upshot’s being probable independently of the basis or by the basis being improbable. In contrast to the concept of impossibility, the concept of probability does not require specification. Further, the addition of the phrase “or worthy of acceptance” allows for upshots that do not involve commitment to the truth of a truth-bearer. In cases where there is such a commitment, the possibility that the basis or upshot is not a truth-bearer can be handled by talking about their truth-bearing content, as with deductive validity. There are however new difficulties with conceptualizing inductive strength. First, the probability of an upshot given a basis is always relative to background information, which should in principle be specifiable. For example, in playing bridge the probability that one’s right-hand opponent has the king of a certain suit given that it is in neither one’s own nor one’s partner’s hand is 0.5 in the absence of further relevant information, but close to 1 if the opposing team has only 12 high-card points between them and one’s right-hand opponent made an opening bid, which usually means at least 12 high-card points. To accommodate this relativity, Carnap proposed that, “in the application of inductive logic to a given situation, the total evidence available must be taken as a basis for determining the degree of confirmation.” (Carnap, 1962, p. 211) The interpretation and rationale of Carnap’s so-called “total evidence requirement” are a matter of ongoing controversy (see for example McLaughlin, 1970), but some acknowledgement of relativity to background information is a requirement of any adequate conception of an inductively good inference. Second, many of the forms of reasoning and argument that are standardly taken to be appraisable in terms of inductive strength (universal generalization, statistical generalization, inductive extrapolation) cannot be assigned a quantitative degree to which the basis makes the upshot probable, unless there is additional background information. Thus, one cannot compute any definite degree to which a generalization or extrapolation is made probable by the observed uniformity in some respect of a proper subset of some class of objects (such as marbles in a jar), unless one has further background information or makes further assumptions (Hitchcock, 1999). And, notoriously, techniques of statistical inference allow one to compute the margin of error around the frequency of occurrence of a property within a certain "universe" or "population" within which there is a probability of .95 ("19 times out of 20") that the frequency of a property in a sample of specified size randomly selected from it will occur, but one cannot compute from the observed sample frequency any definite probability that the population frequency will be within some specified interval around it. Bayes' theorem, which is at the heart of inductive logic, is mathematically unassailable, given its assumptions, but applying the theorem requires a prior probability of the upshot and prior and posterior likelihoods of the basis, numbers that in most real-life situations we do not know.

A further complication of Blair's initial claim that deductive validity (combined with a difference between the upshot and the basis) and inductive strength make for illative goodness is that these properties, however they are glossed, are insufficient. If a basis entails an upshot distinct from it, but it is completely unclear that it does so, then the illative move from the basis to the upshot is not good. To take an example from arithmetic, we know that the Peano axioms in second-order logic completely characterize the natural numbers 0, 1, 2 and so on—in the sense that any property of the natural numbers that can be stated in the vocabulary of those axioms follows necessarily from them. Hence, if Goldbach's conjecture is true, that every even number is the sum of two prime numbers, then there is a deductively valid move from the Peano axioms as basis to Goldbach's conjecture as upshot. Similarly, if Goldbach's conjecture is false, then there is a deductively valid move from the Peano axioms as basis to the denial of Goldbach's conjecture as upshot. But at present nobody knows whether Goldbach's conjecture is true or false—mathematicians have not yet solved this problem, despite more than 250 years of trying (with a million-dollar prize on offer during two of those years). A proof of Goldbach's conjecture or its denial must not only involve deductively valid reasoning from the axioms of arithmetic to the theorem, but must involve steps that human reasoners *know* are deductively valid. (A complication of this example is that, since any consistent second-order logic is incomplete, the logic being used to prove the theorem may not permit one to deduce it from the axioms, even though in fact it follows from them.) The same point can be made about inductively strong inferences. (Hamblin, 1970) expressed the point as the requirement that an upshot follow "reasonably immediately" and "clearly" from its basis. But this requirement is not the end of the story, because there is no well-established general account of when a deductive or inductive link between basis and upshot is reasonably immediate and clear. In a system of deductive or inductive logic, there are basic rules of inference, and one can stipulate that an inference in a proof within that system is good if and only if it is in accordance with those basic rules, or with derived rules that have been established in the development of the system. Generalization on this special type of situation leads one to the dialectical criterion of linkage adequacy that Hamblin ended up endorsing: "The passage from premisses to conclusion must be of an accepted kind." (Hamblin, 1970, p. 245) If we adopt this dialectical framework, then we can interpret Blair’s critical review of the informal logic literature as an inquiry into what kinds of “passage” that are neither deductively valid nor inductively strong we informal logicians accept (or at least are being encouraged by our peers to accept).

4. CONCLUSION

To sum up, Blair has given us an extremely valuable overview of post-war proposals for acceptable types of linkage that are neither deductively valid nor inductively strong. As far as I can tell, his summary is quite accurate. One notable omission is the set of argumentative schemes extracted by Chaim Perelman and Lucie Obrechts-Tyteca (Perelman & Olbrechts-Tyteca, 1958) from the rhetorical, philosophical and literary tradition of European civilization.

I have endorsed Blair’s view that the types of duction are the same for reasoning and for argument, and that at the highest level of generality we are in fact dealing with kinds of legitimate inference, or standards of inference appraisal, rather than with kinds of reasoning or kinds of argument. But at lower levels of generality, I have claimed, the levels where talk of ‘argument schemes’ or ‘reasoning schemes’ is appropriate, we are dealing with kinds of reasoning or argument, kinds whose appropriate standard of inference appraisal may in fact vary from one instance to another. I have also registered my disagreement with the presupposition of the title of Blair’s paper that informal logic has its own distinctive logic. I proposed the term ‘duction’ as a generic term for all legitimate kinds of inference, taking advantage of the existing use of the terms ‘deduction’, ‘induction’, ‘abduction’ and ‘conduction’ for specific kinds of legitimate inference. I argued that ductions cannot be classified in a Poprhyrian genus-species tree, but fall into a matrix structure, with their division according to the formality or type of non-formality of the inference cutting across their division according to their rebuttability or non-rebuttability. I then elaborated at some length on the commonly accepted forms of legitimate inference, deduction and induction, arguing that what constituted a legitimate deduction and what constituted a legitimate induction was more complicated than Blair’s brief description acknowledged.

There is much more to be said about the specifics of the forms of inference recognized and discussed in Blair’s very useful review and comparison.

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