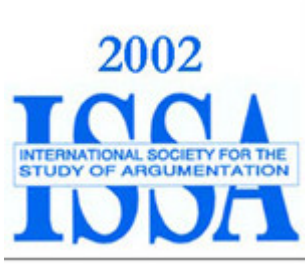
ISSA Proceedings 2002 – Logical Dialectics: The Missing Link Between Deductivism And Pragma-Dialectics



1. Introduction

For a long time, the fields of formal logic and argumentation theory seemed to ignore each other. However, in more recent years the two communities seem to grow towards each other again. One reason for this is the interest in Artificial Intelligence in the logic of common sense reasoning and everyday argumentation. Partly drawing on insights from argumentation theory, AI has provided formal and computational studies of phenomena that for decades were regarded as the province of informal logic and argumentation theory. Two years ago, the two communities met physically, at the very successful *Symposium on Argument and Computation in Pitlochry*, Scotland, organised by Tim Norman and Chris Reed. A consensus seems growing that both communities can learn a lot from each other.

The aim of this paper is to illustrate this point with an analysis of one issue with respect to which argumentation theory has long criticised formal logic, viz. the issue whether deductive validity is the only criterion for evaluating arguments. Argumentation theorists such as Perelman have persuasively argued that that there is more to reasoning than the deductive form of mathematical arguments. Perelman (e.g. Perelman & Olbrechts-Tyteca 1969) stressed that everyday arguments are not simply valid or invalid, but more or less strong, relevant or persuasive. Moreover, Perelman challenged logicians to supplement standard logic with a theory of argumentation that can account for this phenomenon. In this paper, I argue that such an account has become possible by combining various research developments from the last two decades, viz. formal dialogue systems from argumentation theory, models of legal procedure from AI & Law, and models of defeasible reasoning from AI.

I will develop my argument as a critical response to a very interesting recent paper by Leo Groarke in defence of so-called ‘deductivism’ (Groarke 1999). In

Section 2 of this paper I will briefly outline and illustrate Groarke's deductivist account of everyday-argument validity. In Section 3 I shall argue that this account, although definitely illuminating, still ignores some essential elements of everyday arguments. In Section 4 I shall put my analysis in a wider perspective, discussing the relevance of research on argumentation schemes.

2. Deductivism as Applied by Groarke

Groarke (1999) argues against the often-held view that, besides deductive arguments, there is another class of so-called 'inductive' arguments**(i).**The crucial difference is that, while for deductive arguments the truth of the premises *guarantees* the truth of the conclusion, for inductive arguments their truth merely makes the conclusion plausible.

Applying Occam's razor, Groarke (1999) defends the 'deductivist' thesis that natural language arguments should be understood as attempts to formulate deductive arguments. It is important to stress that Groarke does not maintain that deductive validity is the only standard for evaluating arguments. He is careful to point out that deductivism should be embedded in a pragma-dialectical theory of the role of arguments in dialogues, so that arguments can also be evaluated from a dialogical perspective.

Groarke discusses a number of arguments that have been presented in the literature as 'irreducibly inductive'. He claims that all of them can be fruitfully reconstructed as deductive arguments. His strategy is to argue that inductive arguments are based on implicit assumptions which, when made explicit and added to the argument's premises, yield a deductively valid argument.

To illustrate Groarke's strategy, let us look at one of his own examples.

ARGUMENT 1

Ninety-six percent of adult Americans watch television more than ten hours per week. Davis is an adult American. Therefore Davis watches television more than ten hours a week.

Groarke argues that this argument can be plausibly extended with an unexpressed premise as follows:

ARGUMENT 1 (reconstructed)

Ninety-six percent of adult Americans watch television more than ten hours per week. Davis is an adult American. *Davis is among this ninety-six percent*. Therefore Davis watches television more than ten hours a week.

According to Groarke (and I agree), an important benefit of such a deductive reconstruction of an argument is that it highlights hidden assumptions that may need to become the focus of discussion when we decide whether an argument should be accepted.

3. Groarke's Deductivism Critically Examined

I will now critically examine Groarke's deductivism, by applying his strategy to another example of the same kind. I will argue that, Groarke's deductivist reconstruction, although illuminating, still leaves out some crucial elements of the example. I will discuss a legal example, which, although not discussed by Groarke, seems representative for his own examples. The reason for discussing a legal example will become apparent further on.

ARGUMENT 2

Documents that look like an avidavit, usually are an avidavit. This document looks like an avidavit. Therefore it is an avidavit.

Applying Groarke's strategy to this example, we complete it with the following assumption:

ARGUMENT 2 (reconstructed)

Documents that look like an avidavit, usually are an avidavit. This document looks like an avidavit. *This document is among the usual documents that look like an avidavit.* Therefore it is an avidavit.

Clearly, the resulting argument is deductive: anyone who accepts its premises, must accept its conclusion.

As mentioned above, Groarke favours a deductive reconstruction of such arguments since it highlights assumptions which may need to be the focus of discussion. This definitely is a merit of the deductivist strategy. However, it seems to me that Groarke's reconstruction fails to highlight another important feature of such arguments: assumptions such as *this document is among the usual documents that look like an avidavit* are not just additional premises; they are *presumptions*; something that is presumed true in the absence of evidence to the contrary. The notion of presumption is intimately connected with the notion of the burden of proof (cf. Walton 1996). Let us display the deductively reconstructed argument in the context of a dialogue between a proponent and opponent in a critical discussion (e.g. a legal dispute between a plaintiff and defendant in a civil

case), and let us do so in terms of a dialogue system for critical discussion (cf. e.g. van Eemeren & Grootendorst 1992; Hamblin 1970; MacKenzie 1979; Walton & Krabbe 1995):
Proponent: (1) This document is an avidavit.
Opponent: (2) Why is it an avidavit?
Proponent: (3) Since it looks like an avidavit, and documents that look like an avidavit, usually are an avidavit. *This document is among the usual documents that look like an avidavit*.
Opponent: (4) Why is this document among the usual avidavits?

Let us pause here, and see what proponent's obligations are according to the usual dialogue systems. All these systems say that the proponent should provide grounds for the (implicit) claim that this document is among the usual documents that look like an avidavit, or else withdraw this claim. However, in most linguistic communities (and certainly in the law) this is not the case. Instead, the burden of proof shifts to the opponent: it is the opponent's task to show that the assumption does not hold. So the unexpressed premise of an inductive argument often is not just an additional premise but something with a different dialectical status, viz. the status of presumption.
Let us continue the example. The way in which opponent must fulfil her burden of proof is by providing evidence refuting the presumption. But such counterevidence is in fact a counterargument against proponent's inductive (or 'presumptive') argument. This is where logical dialectics comes in. Suppose opponent attempts to fulfil her burden of proof with the following (two-steps) argument.

ARGUMENT 3
This graphological expert says that this document's signature is forged. What experts say in their domain of expertise is usually true. Therefore, this document's signature is forged.
A document that looks like an avidavit but has a forged signature is not among the usual such documents. Therefore, this document is not among the usual documents that look like an avidavit.

The first part of this argument is again inductive, so in the deductivist approach it must be completed with an extra assumption to make it deductive.

ARGUMENT 3 (reconstructed)

This graphological expert says that this document's signature is forged. What experts say in their domain of expertise is usually true. *The present case is among the usual cases as far as this expert is concerned*. So, this document's signature is forged.

Again the reconstructed argument is truth-preserving, so deductive. But the same holds as in Example 2: many linguistic communities (especially the law) will regard the extra assumption as a presumption. So the proponent cannot simply ask for further grounds; instead, he must find a counter-counterargument. Suppose the proponent does so by appealing to another graphological expert, who says that the document's signature is not forged.

ARGUMENT 4
Graphological expert 2 says that this document's signature is not forged. What experts say in their domain of expertise is usually true. So, this document's signature is not forged. If an expert says that a signature is forged while the signature is not forged, the case at hand is not among the usual cases as far as the expert is concerned. Expert 1 says that this signature is forged. Therefore, the present case is not among the usual cases as far as expert 1 is concerned.

The first part of this example is based on the same kind of presumption as the first part of Example 3. Let us again make it explicit.

ARGUMENT 4 (reconstructed)
Graphological expert 2 says that this document's signature is not forged. What experts say in their domain of expertise is usually true. *The present case is among the usual cases as far as expert 2 is concerned.* So, this document's signature is not forged.

Interestingly, the case between the two pieces of expert evidence is symmetrical, so we can extend example 3 to an example of the same form as example 4, attacking example 4.

ARGUMENT 5
Graphological expert 1 says that this document's signature is forged. What experts say in their domain of expertise is usually true. So, this document's signature is not forged. If an expert says that a signature is not forged while the signature is forged, the case at hand is not among the usual cases as far as the expert is concerned. Expert 2 says that this signature is not forged. Therefore, the

present case is not among the usual cases as far as expert 2 is concerned.

In reconstructed form, the first part of this argument becomes
ARGUMENT 5 (reconstructed)
Graphological expert 1 says that this document's signature is forged. What experts say in their domain of expertise is usually true. *The present case is among the usual cases as far as expert 1 is concerned*. So, this document's signature is not forged.

Now that we have two conflicting pieces of expert testimony, the discussion could continue about the issue who of the two experts is the most reliable one. Assume that proponent states the following 'priority argument':
ARGUMENT 6
Argument 4 is based on expert 2 while Argument 5 is based on expert 1. Expert 2 is an internationally recognised expert while expert 1 is from an obscure university. Therefore Argument 4 defeats Argument 5.

Applying the deductivist strategy for the final time, this becomes

ARGUMENT 6 (reconstructed)
Argument 4 is based on expert 2 while Argument 5 is based on expert 1. Expert 2 is an internationally recognised expert while expert 1 is from an obscure university. *Arguments based on internationally recognised experts defeat arguments based on experts from obscure universities*. Therefore Argument 4 defeats Argument 5.

What has the deductivist reconstruction of our legal dialogue given us? We have ended up with six arguments, some of which attack other arguments, and one of which states a preference between conflicting arguments. The conclusion to be drawn from this is that dialogues in which 'inductive' (or in AI's terms 'defeasible') arguments are used, often involve the exchange of arguments and counterarguments for or against a certain claim, and sometimes also of 'metalevel' arguments about the relative force of conflicting arguments. In other words, even if the deductivist claim is granted, it has turned out that carrying out the deductivist strategy in full requires much more than simply adding unstated premises to arguments. What is also needed is an account of what may count as a presumption, which in turn induces the need for an account of the interaction between arguments, counterarguments and priority arguments. Now the latter is

precisely the main subject matter of AI theories of nonmonotonic, or defeasible reasoning; see e.g. Horty (2001) and Prakken & Vreeswijk (2002) for some overviews. This field has developed formal systems for generating arguments like our (1-6) from a body of information, and for determining which of those arguments survive the competition, in other words, which conclusions are 'defeasibly justified' on the basis of the given body of information. I hope that my attempt to carry out Groarke's deductivist strategy to the 'extreme' has convinced the reader that these fruits of AI research are relevant to argumentation theory.

Having said this, I do by no means want to argue that argumentation theory should simply 'swallow' these fruits of AI. In fact, AI has tended to ignore the dialogical and dynamic aspects of defeasible reasoning, and this is, of course, where it can learn a lot from argumentation theory. Some AI work already looks at argumentation theory in this respect, for example, Loui (1998) and Vreeswijk (1995) in general AI, and Gordon (1995), Lodder (1999), Hage 2000, Bench-Capon (2002) and Prakken (2001a,2001b) in AI & Law.

In the introduction I promised to explain how the deductivist 'all-or-nothing' view on the validity of arguments can be reconciled with Perelman's view that everyday arguments are more or less persuasive. To sum up, the core of my explanation is that one needs to embed an account of which arguments can be constructed in an account of how arguments should be evaluated in the presence of counterarguments. Of course, there are many aspects to persuasiveness of arguments. In this paper I have identified two such aspects, viz. the use of presumptions, and the formulation of priority arguments. Presumptions are persuasive in that a linguistic community (in Perelman's terms an 'audience') is prepared to accept them in the absence of evidence to the contrary. And priority arguments explicitly declare why some 'object level' arguments are more persuasive than others.

Hopefully, this detailed analysis of what initially seemed to be a simple example has convinced the reader that there is something in between the deductive level and the dialogical level, viz. the level of 'logical' dialectics. I now turn to the relevance of this conclusion for the 'inductivist' thesis.

4. Does Occam's Razor Really Cut Inductive Arguments?

I conclude this paper with arguing that my analysis is not only relevant for deductivist but also for inductivist accounts of everyday arguments. Recall that, according to an inductivist, certain classes of arguments cannot be fruitfully reduced to deductively valid arguments. In fact, if we look at Groarke's own

examples and the examples of this paper, we see that very often the assumption-to-be added can be found by applying a general pattern. For instance, in statistical arguments (such as Argument 1), the assumption can be generated from the pattern that the case at hand is in the majority class. In 'rules-of-thumb' arguments (such as Argument 2), we can use the pattern that things are as usual. And in the appeals to expert opinion (Arguments 3 and 4) we have applied the pattern that the expert judges as usual. Now whenever the extra assumptions can be found by applying general schemes, it seems fruitful to regard such arguments as instances of defeasible, or 'presumptive' argument schemes. (cf. Walton 1996). The critical questions of such argument schemes reveal the presumptions underlying the scheme, but they also point at possible counterarguments: positive answers to critical questions correspond to presumptions, and negative answers to counterarguments. For instance, in (Walton 1996, 65), one of the critical questions attached to the argument scheme from expert opinion is
Is the expert consistent with what the other expert in this domain say?
Clearly, Argument 5 above results from a negative answer to this question.

An interesting question is whether such argument schemes should be regarded as 'assumption generation' schemes in the deductivist approach, or as 'irreducibly inductive' argument schemes in the inductivist approach. Both views seem to have their merit (and indeed, both approaches have been used in AI to formulate nonmonotonic logics; the assumption-approach was initiated by Poole (1998), while the inductivist approach is due to Pollock (1987)). However, for present purposes it is important to note that, whatever answer to this question is given, both approaches need an account not only of which arguments can be constructed, but also of how they must be evaluated in the presence of counterarguments and priority arguments. In other words, both approaches require an account of logical dialectics as the missing link between structural and dialogical criteria of argument evaluation.

NOTES

i. The terminology in argumentation theory seems to differ somewhat from that in AI: what argumentation theory calls inductive arguments, is called a defeasible argument in AI. One species of an AI-style defeasible argument is an inductive argument in the 'standard' philosophical sense ('All observed swans are white, therefore all swans are white'); see e.g. Goodman (1955). In this paper I will use the term 'inductive' in the sense of argumentation theory.

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