

# Arguments from authority and expert opinion in computational argumentation systems

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**Abstract** In this paper we show that an essential aspect of solving the problem of uncritical acceptance of expert opinions that is at the root of the *ad verecundiam* fallacy is the need to disentangle argument from expert opinion from another kind of appeal to authority. Formal and computational argumentation systems enable us to analyze the fault in which an error has occurred by virtue of a failure to meet one or more of the requirements of the argumentation scheme from argument from expert opinion. We present a method for enhancing this capability by showing how arguments from expert opinion are related to, but different from, arguments from deontic authority.

**Keywords** Deontic authority · Fallacious argument from authority (*argumentum ad verecundiam*) · Argument from expert opinion · Defeasible argumentation

## 1 Introduction

There is now a considerable literature, both in argumentation studies generally and in artificial intelligence research on argumentation, dealing with argument from expert opinion. This form of argument was traditionally

categorized as an informal fallacy by the logic textbooks, but in recent years a revolution has taken place, and it is now regarded as a legitimate argument. It is nevertheless a dangerous one that can go wrong in some instances and be quite deceptive as a rhetorical tool for strategic maneuvering in argumentation (van Eemeren 2010). Hence we have the problem of distinguishing between the fallacious and non-fallacious cases. When this form of argument is legitimate, it is important to recognize its defeasible nature. It provides the user only with presumptive reasoning for accepting the conclusion, subject to further investigations and to critical questioning. Through the studies of this form of argument in the recent literature, we now have a good idea of how it works as a defeasible argument, and we even have formal and computational argumentation systems that have been built in artificial intelligence and that can accommodate argument from expert opinion as a standard form of argument by including it in their repositories of argumentation schemes (Walton 2016).

Given that it is widely recognized that this type of argument can also be fallacious, however, there remains more work to fully explain the fallacy or fallacies involved in it. What has been suggested is that the fallaciousness is linked with the notion of authority (Walton 1997), since the argument from expert opinion has long been traditionally linked to the notion of authority and textbook treatments of the fallacy, and a few authors, as we shall see, have distinguished between argument from an expert opinion, and argument from appeal to authority of a different sort, resting on a notion of deontic or administrative authority. In this paper we show that whereas argument from expert opinion concerns reasoning about how things are in theoretical reasoning, the other type of authority labeled ‘deontic’ or ‘administrative’ needs to be modeled as a species of practical reasoning (see, e.g., Atkinson et al.

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2006). This kind of reasoning leads to a decision to take action, based on an agent's goals and its knowledge of the circumstances of a given case. The distinction between epistemic and deontic types of argumentation schemes is becoming important for argument mining (Macagno 2015). In this paper we also show understanding and analyzing this very ambiguity in the meaning of the term 'authority' is a necessary element for building an argumentation model that can be used to explain how the *ad verecundiam* fallacy works.

Part two gives a very brief survey of some kinds of authority recognized in the current literature. Part three presents the argumentation scheme and the list of critical questions for the argument from expert opinion. Part four shows how arguments from expert opinion are evaluated in a formal and computational argumentation system called the Carneades Argumentation System. Part five briefly discusses how the *ad verecundiam* fallacy relates to these concepts of authority. Part six compares how the two main types of authority recognized in the paper compare to each other when they appear as components of arguments from authority. Part seven gives two examples where it appears that the *ad verecundiam* problem arises from the mixing of the two kinds of authority. Part eight proposes a basic system for classifying arguments from authority. Part nine presents conclusions. In part ten we discuss directions for further research that focus on combining the approach present in this paper with some relevant work in the area of online visualization of arguments and human–computer interaction.

## 2 Kinds of authority recognized in the current literature

In the current literature, there are at least two areas that are important for the study undertaken in this paper: (i) philosophical and psychological works on types of authority in social communication, and (ii) attempts at employing those distinctions in argument studies.

In the philosophical and logical literature devoted to the notion of authority, there are a number of distinctions which grasp the diversity of authorities. The example pairs of such terms are: 'cognitive–administrative' (Wilson 1983), 'epistemic–executive' (De George 1985), and 'epistemic–deontic' (Bocheński 1974; see Walton and Koszowy 2015, p. 1486).<sup>1</sup> Despite the variety of terms employed to distinguish major types of authority, we may observe that all these three distinctions refer to the difference between authority based on knowledge ('cognitive',

'epistemic') and authority based on directives ('administrative,' 'executive,' 'deontic'). We may also observe that the relational approach to defining 'authority' employed by De George is in line with Bocheński's proposal. Both authors conceive authority as a relation between subjects: X is an authority for Y. Bocheński's account of authority consists of a further detailed analysis of this relation.

Wilson (1983) drew a distinction between cognitive authority and administrative authority. However, he did not define cognitive authority in relation to argument from expert opinion, and emphasized that having authority is different from being an expert (Wilson 1983, p. 13). Our approach is different, because we see cognitive authority as based on argument from expert opinion, and we define argument from authority as a contrasting type of argumentation.

De George (1985, p. 14) defines authority as a relational property in which the authority stands in relation to someone else as a superior stands to an inferior with respect to some field or domain. When authority is defined in this relational manner, it sets up an imbalance of freedom between the authority and the other party who must obey the commands of the authority. For example, the slave is subject to the authority of the master (De George 1985, p. 120). Because it helps to pinpoint the difficulty of questioning the pronouncement of an authority, this example shows a way forward in helping to explain the *ad verecundiam* fallacy.

The distinction between epistemic and deontic authority has been also employed in the psychological study of social interactions. It has been for instance used in justifying the claim that along with the *epistemic* dimension of authority, participants of social interactions orient also to the *deontic* dimension, i.e., on rights and obligations (see, e.g., Heritage and Raymond 2005; Stevanovic and Peräkylä 2012, p. 298). From the point of view of our inquiry into the complexity of arguing from authority, this line of research may become yet another motivation for focusing systematically on social and psychological aspects of arguments from various types of authority. Hence, after making plain some basic ways in which various types of authority work in argumentation, a significant line of inquiry could also focus on exploring argument structures involving authority in the broader context of complex social and cognitive interactions.

The distinctions outlined above are also applied in argument studies. Some argumentation theorists place the discussion of distinct types of authority in the context of elaborating criteria for analyzing and evaluating arguments. Their inquiry is associated with an assumption that distinguishing between various types of argumentative appeals to authority should be helpful in improving tools for argument analysis and evaluation. For example, Goodwin (1998) and Wagemans (2011) propose various typologies of arguments from authority.

<sup>1</sup> These and other distinctions are listed e.g. in Goodwin (1998, p. 278).

Goodwin (1998) proposes to distinguish three types of authority: authority based on a command (which can be associated with our notion of deontic authority), authority based on expertise (which is close to the notion of epistemic authority), and authority based on dignity (which has no point of reference in our basic typology). Goodwin argues that the traditional distinction between arguments from epistemic and deontic authority does not do full justice to the diversity of authorities in argumentation, because it does not encompass those appeals to authority that are based on dignity. Since dignity is a crucial factor of an ‘appeal to shame’ (i.e., the fallacious instance of an *argumentum ad verecundiam*), Goodwin’s distinction could be taken into account in the future study of *argumentum ad verecundiam*. Since in this paper we just focus on examining the explicatory role of the epistemic–deontic distinction, we do not refer to arguments from dignity. However, in our view, the category of arguments from dignity may play an explicatory role, e.g., in identifying those dialogue structures that fallaciously exploit an *argumentum ad verecundiam* technique. The linkage between them is due to the fact that the *argumentum ad verecundiam* understood as an appeal to shame may exploit, at least in some cases, the component of (apparent) dignity. The use of this fallacy may in other words consist of building a sort of an ‘aura of dignity’ around the expert.

Another typology of arguments from authority may be found in (Wagemans 2011, p. 333), who proposes to distinguish between arguments from invested opinion and arguments from expert opinion. This distinction is parallel to our epistemic–deontic division. Arguments from expert opinion are further divided by Wagemans into two categories: argumentation from professional expert opinion and argumentation from experiential expert opinion. For the purpose of this paper the distinction between two types of arguments from expert authority is not employed; however, it should be taken into account in proposing a general classification system for arguments from authority (see Sect. 8, Fig. 5).

These approaches to types of authority and arguments from authority constitute a conceptual framework that will be (directly or indirectly) employed in what follows, particularly in explaining what roles various types of authority play in argumentation.

### 3 The scheme for argument from expert opinion

The most basic version of the argumentation scheme<sup>2</sup> for argument from expert opinion is given in (Walton et al. 2008, p. 310) as follows.

<sup>2</sup> For the conditional version of the scheme see Walton (2014b).

Major Premise: Source *E* is an expert in subject domain *S* containing proposition *A*.

Minor Premise: *E* asserts that proposition *A* is true (false).

Conclusion: *A* is true (false).

An argument from expert opinion should be evaluated by the asking of six basic critical questions.

*Expertise Question*: How credible is *E* as an expert source?

*Field Question*: Is *E* an expert in the field *F* that *A* is in?

*Opinion Question*: What did *E* assert that implies *A*?

*Trustworthiness Question*: Is *E* personally reliable as a source?

*Consistency Question*: Is *A* consistent with what other experts assert?

*Backup Evidence Question*: Is *E*’s assertion based on evidence?

If a respondent asks any one of the six critical questions, the original argument defaults unless the question is answered adequately. Once a question has been asked and answered adequately, the burden of proof (Walton 2014a) shifts back to the questioner to ask another question or accept the argument.

This form of argument seems reasonable enough, as long as it is recognized that experts are fallible, and that arguments of this form are defeasible. The argument from expert opinion can be classified as a species of knowledge-based reasoning, of the kind that has been modeled in computational expert systems technology. In cases where the knowledge base supporting the conclusion is epistemically closed, meaning that it contains all the knowledge that there is to know on this particular subject, the argument from expert opinion could be seen as deductively valid. However, arguments from expert opinion are generally best treated as defeasible.

How are appeals to expert opinion of this form to be evaluated? In the most typical kind of case, such an argument is best seen as having a presumptive status, rather than as being deductively valid or inductively strong. According to the analysis presented in (Walton 1997), correct use of appeal to expert opinion by a proponent in a dialogue brings forward a weight of presumption subject to default depending on the asking of certain critical questions by the respondent in the dialogue. An argument of this form, when used correctly, establishes a presumption in favor of the conclusion. But the establishing of such a presumption is not final proof of the conclusion. The argument is open to questioning, and it may have to be retracted if the questions cannot be adequately answered. This may not prove that the presumption is false. It may

only establish that it is dubious or contestable. Showing that there is not a consensus among the experts does not prove that an expert opinion is false. It may only show that the claim should not be accepted on the basis of expert opinion.

Some comments on these critical questions will be helpful to the reader. First, some comment about credibility and reliability of sources is required. To an observer, it may not be clear how the expertise question, concerning credibility, is different from the trustworthiness question, concerning personal reliability. These two questions are often run together. But a case can be made (Waller 1988, p. 126; Walton 1997, pp. 213–217) for treating them separately. The trustworthiness question has to do with the honesty or veracity of a source. This is a question about the ethical character of a source, but all appeals to expert opinion are based on such an assumption. The expertise question has to do with the competence of the expert. An expert has credibility because she presumably has knowledge in the field in question, but also shows that she is competent in weighing and balancing that knowledge in a perspective that shows good judgment skills. So both trustworthiness and competence need to be considered in evaluating an appeal to expert opinion. As Waller points out (p. 126), the testimony of a lying expert is no more helpful than the testimony of a sincere incompetent.

The field question is important, because of the halo effect whereby an expert in one field may erroneously be thought to have competence in some other field. The opinion question is important because what the expert actually said is not always quoted directly. A rephrasing may cover up qualifications, or subtle but important shadings of wording in what an expert actually said. The consistency question is vitally important in many cases because experts can disagree, as in cases of the ‘battle of the experts’ in court. The supporting evidence question is important because an expert should be presumed to have based her opinion of evidence in her field of expertise, and not just on her personal opinion. The use of expert opinion in argumentation should be seen as carrying a weight of presumption, but it should also be seen as open to challenge and critical questioning. The best approach to arguments based on appeals to expert opinion should steer a course between *authoritarianism*, dogmatic acceptance of expert opinion, and *skepticism*, automatic dismissal of expert opinion as subjective.

#### 4 How to evaluate arguments from expert opinion using the Carneades Argumentation System

The study of how to identify and evaluate fallacious arguments from expert opinion in this paper is based on the general method of argument evaluation set out in (Walton

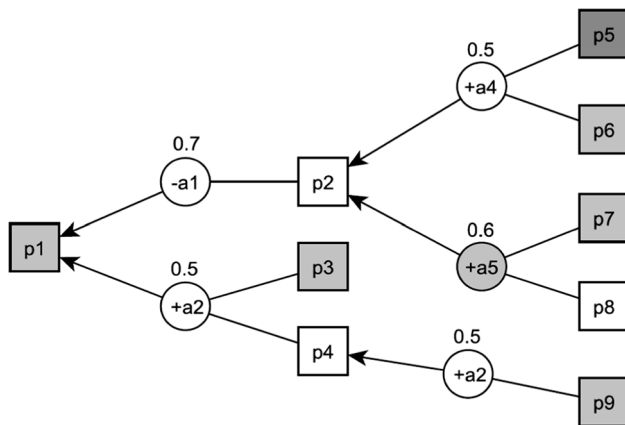
2016) that uses formal argumentation models from artificial intelligence. There are several such models available (Prakken 2011), but the one applied here, the Carneades Argumentation System (CAS), is useful for our purpose because of the way it defines an argument as a graph. Arguments are evaluated using argumentation schemes and argument graphs, structures that are comparable to the well-known argument diagrams. In CAS an argument is modeled using a directed graph consisting of a set of nodes and a set of arrows joining them (Gordon 2010). In addition to rectangular statement nodes there are round nodes that contain notation indicating an argumentation scheme. CAS distinguishes between pro and con arguments in an argument graph. The graph collects all the premises and conclusions together and shows how each set of premises leads by an argument to a conclusion, and how the conclusion can be used as a premise in another argument. By this means a large graph can represent a mass of connected arguments, typically as a tree with the ultimate conclusion at the root. Examples are given in Figs. 2 and 3.

CAS uses the device of an audience, along with argumentation schemes, to evaluate arguments. Generally speaking, if the audience accepts all the premises of an argument, and the argument fits a particular argumentation scheme, then a presumption is shifted onto the conclusion so that CAS calculates that the conclusion is also acceptable to the audience. CAS also uses standards of proof to evaluate arguments for example according to the preponderance of evidence standard, which requires that the weight assigned to a pro argument must be greater than the weight of a con argument (Gordon et al. 2007). Earlier versions of CAS allow a user to assign numerical weights to arguments in an argument graph, representing the strength with which an audience accepts the argument (Gordon 2010).<sup>3</sup>

In the example argument graph in Fig. 1, an accepted proposition is shown in a light gray box. A rejected proposition is shown in a dark gray box. Each argument is attached a numerical weight that represents how strongly the audience accepts it.

In this example, the ultimate thesis to be proved or refuted is the proposition p1 shown at the extreme left of Fig. 1. There are two main arguments. The argument a2 is a pro argument supporting p1. It is a linked argument requiring both premises to be accepted. One of its premises, p3, is accepted. However, the other premise, p4, is not accepted, as indicated by its being shown in a box with a white background. But p4 is supported by another argument a2 that only has one premise, and this premise, p9, is accepted by the audience. Hence CAS

<sup>3</sup> See also the Carneades blog (<https://carneades.github.io/>) for a brief description of the new features.



**Fig. 1** Example illustrating how an argument is evaluated in CAS

automatically calculates that the conclusion p4 is also accepted. So CAS will automatically redraw the diagram so that p4 is drawn in a box with a light gray background. But once this is done, the situation is such that both premises of a2 are accepted. So now it looks like p1 should be accepted because it has been supported by a pro argument that has a weight of 0.5. For if the burden of proof set for p1 is the requirement of preponderance of the evidence, argument a2 is strong enough to fulfill that requirement.

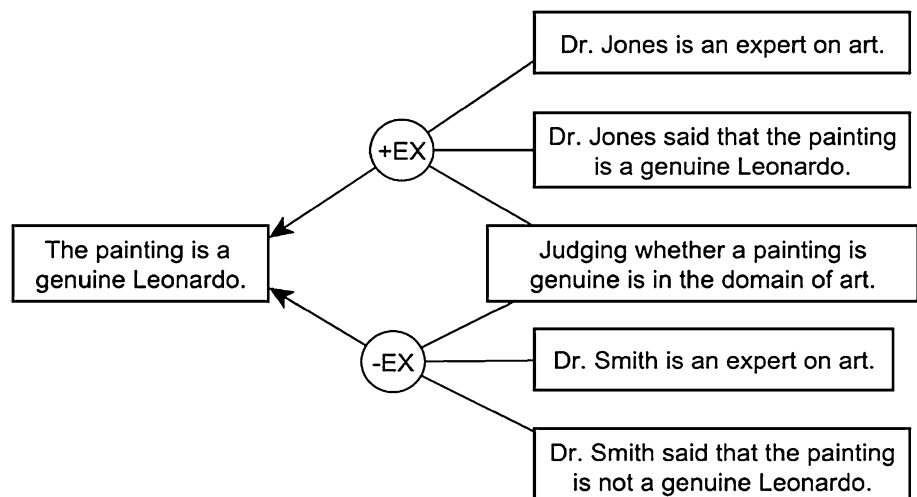
But the con argument a1 has not yet been taken into account. This argument has only one premise p2, which is neither accepted nor rejected by the audience. However, it is supported by two other arguments a4 and a5 which might persuade the audience to accept it. Argument a4, however, has one premise p5 that is rejected by the audience. Argument a5 has one premise p8 that is neither accepted nor rejected by the audience. Both are linked arguments requiring all of their premises to be accepted in order to be strong enough to require acceptance of the conclusion.

Neither of these arguments will convince the audience to accept p2. Hence when CAS calculates the outcome of these two arguments, p2 will remain in a box with a white background, as shown in Fig. 1. Even though a1 is the stronger argument, having a weight of 0.7, a2 prevails. Hence the ultimate conclusion p1 is automatically shown by CAS in a light gray box, indicating that it needs to be accepted.

In general, CAS models burden of proof dialectically by using proof standards to aggregate pro and con arguments (Gordon and Walton 2009). An argument is sufficient to prove its conclusion only if its premises are accepted by the audience and if it satisfies the proof standard appropriate for the type of dialogue. Several legal standards of proof exist, for example the preponderance of the evidence standard, also known as the balance of probabilities, the standard applicable in civil cases. The preponderance standard is met by the proposition at issue if its pro arguments are stronger than its con arguments, no matter how much stronger they may be. This means that the weight of an argument that meets this standard must 0.5 or greater. The default proof standard in Carneades is preponderance of the evidence, but other standards, such as that for clear and convincing evidence, can be chosen as appropriate for the context of dialogue by the user (Gordon and Walton 2009). Later versions of CAS use other devices for assigning argument weights, but the basic features of CAS described above are maintained.

As shown in Walton (2016, Chapter 4), CAS can be applied to the tasks of modeling and evaluating arguments from expert opinion. These tasks are carried out by modeling the critical questions as counterarguments to an instance of an argument from expert opinion. Arguments can be attacked in basically three ways. An argument can be rebutted by attacking its conclusion. It can be undercut by attacking the inferential link between the premises and

**Fig. 2** Conflict between arguments from expert opinion



conclusion. Or it can be undermined by attacking one or more of its premises.

How CAS can use argument graphs to model some common types of argument central to evaluating arguments from expert opinion is illustrated by two examples. In the first type of argument, there is a conflict between two opposed opinions by two different experts who contradict each other. In the second type of argument, the argument from expert opinion is defeated by asking critical questions matching the scheme for argument from expert opinion. In Fig. 2, the circular node in the argument graph contains the scheme for the argument from expert opinion. We are shown an argument from expert opinion matching the scheme. But at the bottom of the diagram, we also have an argument from expert opinion with the opposite conclusion. This argument too fits the scheme for argument from expert opinion. In legal cases such a deadlock is called the battle of the experts.

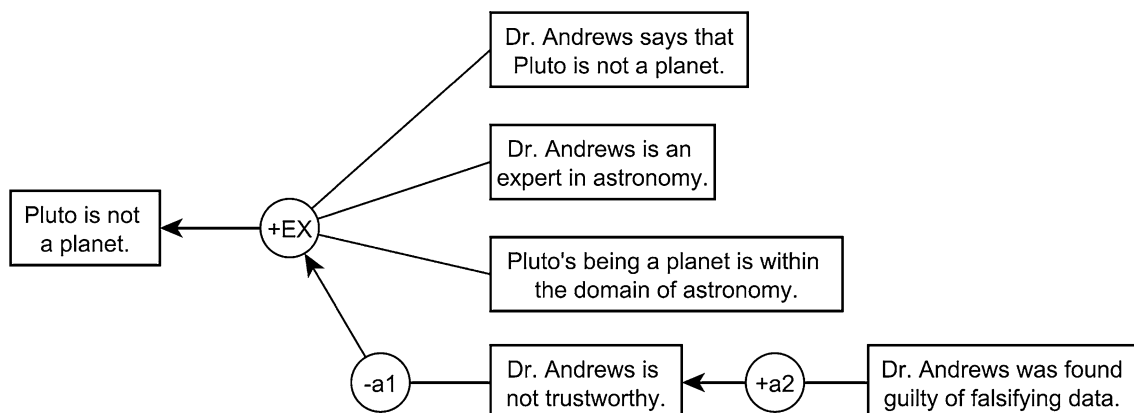
Figure 2 shows an example of a counter-argument from expert opinion rebutting a prior argument from expert opinion. The reader will recall from remarks above that there are three basic ways of attacking an argument, rebutting, undermining and undercutting. The basis of this distinction stems from Pollock (1995). He distinguished between two kinds counter-arguments he called rebutting defeaters, or rebutters, and undercutting defeaters, or undercutters (Pollock 1995, 40). A rebutter attacks the conclusion of a prior argument. An undercutter attacks the inferential link between the claim and the reason supporting it. Pollock used the red light example (1995, 41) to illustrate how undercutters work. If a light looks red, then (defeasibly) it can be accepted that it is red. But if said light is illuminated by a red light, it may look red but not be red.

In Fig. 3, the argument from expert opinion shown at the top is undercut by the counter-argument that Dr. Andrews is not trustworthy. The notation  $-a1$  and  $+a2$  in two of the

nodes indicate instances of arguments where no scheme from the current repository in CAS can be instantiated in these two instances. The only information made visible on the diagram is that one is a con argument and the other is a pro argument.

The claim that Dr. Andrews is untrustworthy by itself is not enough to defeat the original argument from expert opinion. But when backed up by the additional claim that Dr. Andrews was found guilty of falsifying data it shifts the burden of disproof back onto the original arguer. The reader can easily see from these simple examples all arguments from expert opinion that are connected together and connect to other arguments in a large mass of argumentation in a given example can be evaluated using the tools available in CAS. The examples support the hypothesis that arguments from expert opinion should generally be treated as defeasible.

Basically the rationale for this hypothesis is the empirical observation that time and time again, the experts have turned out to be wrong (Freedman 2010). There are many reasons for this fallibility of expert opinion. One is that scientific knowledge has to be treated as falsifiable (Popper 1972; Cooke 2006) because it is based on hypotheses that need to be open to scientific scrutiny and testing its new knowledge comes in. Another is that certain kinds of predictions made by experts, for example experts in economics and financial matters, relate to the economy, something that is complex because it comprises a huge and rapidly changing knowledge base. Therefore, any decision made about it has to be made under conditions of uncertainty, and even inconsistency of knowledge due to the changing circumstances. From a logical point of view this type of argument should only lead to a conclusion with a presumptive status, and the argument itself should generally be seen as subject to critical questioning. For these reasons defeasibility is a very important property of arguments from expert opinion.



**Fig. 3** Undercutting of argument from expert opinion

The explanation for the traditional informal fallacy of the *argumentum ad verecundiam* given in Walton (1997) is that it is hard for a layperson in the field of knowledge to critically question an expert, or the opinion of an expert brought forward by a third-party, because a claim based on expert opinion is so powerfully supported by this form of argument that in fact it may be hard, or even appear inappropriate, for a questioner or to raise doubts about it. Thus the clever sophist who appeals to argument from expert opinion in a forceful way may be abusing what should be regarded as an essentially defeasible form of argument that should always be open to critical questioning, collection of further evidence and potential revision.

## 5 The ambiguity of ‘arguments from authority’

Despite the lack of thorough analyses of appeals to other authorities than just epistemic ones, some argumentation scholars pay special attention to the need of developing a broader account of arguments from authority. Although in our paper we do not distinguish authorities based on commands from those founded on dignity, we are in fact referring to both under the general heading of ‘deontic’ or ‘administrative’ authority.<sup>4</sup> The main reason for using a dichotomic distinction between epistemic and deontic authority in our inquiry is that it is sufficient for the purpose of our paper, i.e., grasping the nature of *ad verecundiam* arguments which have two basic forms. These forms may be discussed using terminology taken from speech act theory (see Sect. 1): arguments basing on statements (i.e., assertives) and those which indicate what should be done (i.e., speech acts employing directives).

The discussion of the explicatory role of various notions of authority may also involve some attempts at perceiving authority as a feature of norms. For example, Veerbek (2007, p. 245) discusses the claim that some norms *have* authority in the sense that “the fact that the norm requires certain behavior is sufficient reason to act in accordance with it”. Within this account (which is based on Razian notion of authoritative norms; see Raz 1979), authority is conceived as a feature which is related to norms. Since norms indicate what should or what should not be done, the study of the authority of norms (Veerbek 2007; Keren 2014) is clearly in line with the present study of arguments from deontic authority which is also based on the notion of a norm.

<sup>4</sup> In the field of legal theory, administrative or formal authority based on a support of an institution is distinguished from deontic authority according to which certain behavior is defined as obligatory or permitted and this qualification is binding on the addressee of the argument (Araszkievicz and Koszowy 2016, pp. 16–17).

Now we are at the point where we can define the notion of administrative authority as a recognizable concept when encountering an argument from administrative authority in a natural language text so we can contrast this type of argument with an argument from expert opinion. In an argument from expert opinion, the premises are put forward to support the claim that the conclusion is true or false based on the expert’s saying that the claim is true. This type of argument can be called epistemic, to contrast it with the argument from administrative authority. The latter is a practical kind of argument used in deliberations on deciding what to do in a situation requiring a choice. In line with the above remarks suggesting the existence of a deontic form of argument from authority as a distinctive type of argument, we propose the following scheme for argument from administrative authority. The variable  $\alpha$  stands for something done, an action carried out by an autonomous intelligent agent.

*Major Premise:*  $\delta$  is an administrative authority in institution  $\Omega$ .

*Minor Premise:* According to  $\delta$ , I should (or I should not) do  $\alpha$ .

*Conclusion:* I should (or I should not) do  $\alpha$ .

Now we have two kinds of argument from authority, but more importantly, we have two contrasting argumentation schemes. One represents arguments from expert opinion and the other represents arguments from administrative authority. Our recommendation is that formal and computational argumentation systems such as CAS should now add this new scheme to their repositories of schemes.

## 6 Defeasible nature of the two kinds of arguments from authority

The concept of an administrative authority refers to a relationship between two agents communicating in a dialogue where one has a right to exercise command or influence over the other. Typical directive speech acts for this type of multiagent communication are those of command, require and forbid. The dialectical framework for the concept of a cognitive authority involves quite different speech acts. In this framework, there are three agents involved. The first agent brings forward an argument based on expert opinion. She is the proponent. The second agent is the party to whom the argument was addressed. He is the respondent. The third agent is the expert itself (himself), who/which could be a person, or a piece of software, for example an expert system. Here the speech act the proponent starts with is that of putting forward an argument (an assertion taken to be supported by reasons). The respondent has the role of asking critical questions at the

next move (or putting forward counter-arguments). The expert source could be passive in some cases. In the classic logic textbook examples, the reader is given only the text or reported claim of the expert. In some real cases, however, the expert could be present to be questioned as well (as in a legal case).

Another observation regarding two types of authority is that the defeasibility of the argument from administrative type of authority rests on a different basis from that of the defeasibility of the argument from epistemic type of authority. The pronouncement of an administrative authority, even if legally binding, can be subject to appeal in many instances, but disobedience may have harsh penalties in some instances. So there may be circumscribed limits in some cases on how much questioning is allowed or is appropriate.

These problems about the defeasible nature of both kinds of arguments from authority relate to the different stages of argumentation: the opening stage, the argumentation stage and the closing stage (e.g., Van Eemeren and Grootendorst 2004, pp. 59–62). There is the question of when a procedure like a scientific investigation or criminal or civil trial can be considered to be closed, so that the conclusion stands as the outcome of the procedure. Jumping ahead to close off such a procedure too quickly is associated with many kinds of fallacies, because many of the kinds of arguments associated with informal fallacies, such as the argument from expert opinion, are inherently defeasible, but may easily be taken to be conclusive.

The problem here is that the administrative type of appeal to authority has critical questions that are different from those of the epistemic type of appeal to authority.

CQ1: Do I come under the authority of institution  $\Omega$ ?

CQ2: Does what  $\delta$  says apply to my present circumstances  $C$ ?

CQ3: Has what  $\delta$  says been interpreted correctly?

CQ4: Is  $\delta$  *genuinely* in a position of authority?

Therefore, if there is some confusion about which category a given appeal to authority should fall into, it may be easy to mistakenly treat an argument from expert opinion as though it were based on an administrative appeal to authority. In such a case the recipient of the argument might not know how to respond and may presume that it would be inappropriate to raise critical questions about the argument. So the fallacy in such a case resides in the reaction of the recipient to such an argument, but it may also arise from the way the proponent of the argument puts it forward. The proponent may presume, or even state explicitly, that the respondent has no right to question the argument from expert opinion at all. In the most characteristic instances of the *argumentum ad verecundiam* (Walton 1997) the person to whom the argument was

directed is intimidated by what he takes to be the apparent authority of the speaker. The observation of (Walton 1997, p. 252) based on examples was that one of the most common kinds of cases studied in the social sciences (Caplan 1984; Freedman 2010) in which an appeal to authority is fallacious is one in which the appeal to administrative authority is put forward in such a way that it appears more conclusive, and hence less open to critical questioning, than can be justified by the circumstances of the case. It was also observed in (Walton 1997, p. 252) that this particular fault often co-occurs with cases where an appeal to epistemic authority is overlapped with or is confused with an appeal to administrative authority.

The importance of approaching argument from expert opinion as a defeasible form of argumentation that needs to be subject to critical questioning is abundantly emphasized by the study of many examples of expert opinions in Freedman (2010) that turn out to be incorrect. These examples show that expert pronouncements in such areas as medicine, school improvement, parenting, dieting and nutrition advice generally, business and science are not only commonly wrong, but are also very often based on fallacious reasoning, bias, career pressures, and manipulation motivated by financial interest. For example, expert witnesses are paid to testify by the side that hires them in law. One solution to the problem he considers is to keep score of how often experts are right or wrong (Freedman 2010, p. 209). But the difficulty of setting up a scoring system of this sort requires deciding what sort of rightness should win points and what sort of wrongness should lose points. In the end, the best solution to the problem that Freedman can find is basically the argumentation approach of being carefully skeptical about experts opinions by asking the right critical questions and considering relevant counterarguments such as once provided by second opinions or further research.

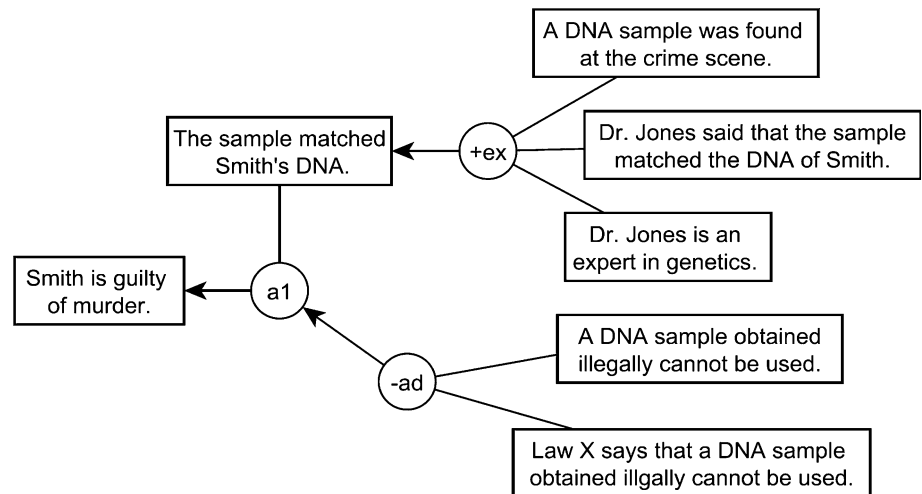
## 7 Mixing the two kinds of argument

It is interesting to note that some of the classic cases of argument from authority combine argument from expert opinion with argument from administrative authority. It is also interesting to see how CAS can model cases of evidential reasoning in law where the argument from expert opinion type of authority can conflict with the argument from administrative authority. In Fig. 4, an argument from expert opinion is used as evidence to support the proposition that Smith is guilty of murder, the ultimate claim to be proved by the prosecution.

Let us assume that this argument fits the requirements for the scheme for argument from expert opinion as indicated by the notation  $+ex$  in the argument diagram. Here



**Fig. 4** Expert opinion argument undercut by an administrative authority argument



we have simplified the argument for purposes of illustration by the omitting the implicit premises that the matching of the DNA samples shows that Smith was at the crime scene and that this evidence, taken along with the other elements of the crime of murder in a given jurisdiction, provides an argument that supports the claim that Smith is guilty of murder.

But let us look at the counter-argument at the bottom of the diagram. Let us say that this argument is a legitimate instance of the scheme for the administrative argument from authority, as indicated by the notation *-ad* in the argument node. The minus sign indicates that this argument is a counterargument attacking the prior argument from expert opinion. In fact it is shown as an undercutter of that argument, as indicated by the argument from administrative authority being directed to the argument node *a1*. In CAS an undercutting argument represents the kind of critical question classified as an exception. In this instance, what it means is that an expert opinion argument based on DNA evidence is generally accepted as a persuasive form of argument in the courts, but a defeasible one that can be refuted if an exception to the general rule is found. In this instance, once Law X is stated, along with a citation indicating its source, the undercutting argument defeats the prior argument from expert opinion.

One of the classic kinds of cases familiar to most of us from personal experience is that of a patient who visits her doctor and who has difficulty critically questioning the information or advice that the doctor is giving to her. She is not an expert, and because she is somewhat intimidated by physicians, and worried about her situation, and therefore having to rely on physicians, she has difficulty not only trying to ask the right questions but even remembering the information the doctor is trying to transmit to her. Some classic cases of this sort were studied in Walton (1997). In

this case there is a mixture of the two different kinds of authority. The physician as a medical doctor is required to have a certifiable degree of medical knowledge appropriate for the case, but she or he also has the administrative power to tell the patient what to do or what not to do in certain circumstances, and this power often carries with it an administrative justification for actions and advice given. In studying cases, the problem here may be to differentiate between the roles of the two types of authority in the argumentation and its outcomes. More detailed case studies of extended examples need to be done in order to provide a further empirical basis for studying the *ad verecundiam* fallacy.

One deservedly famous classic case was the experimental work on obedience to authority carried out by Milgram (1974). The purpose of this social science experiment was to find out how strong an electric shock a subject would administer to a victim following the orders given by an experimenter dressed in a white lab coat. The subject was told to give a shock to the victim each time he gave a wrong response to a test question. The victim reacted in such a way as to indicate that he was in severe pain when he received a shock. The experiments showed that ordinary people were persuaded to perform actions that they thought were highly painful to a fellow human being to an extent that was very surprising. Evidently the reason why the subjects were persuaded to perform in such a surprising way was the appearance of authority given to the person dressed as a scientist and the portrayal of the proceedings as a scientific experiment. In such a case the role of expert opinion authority may be hard to disentangle from the role of administrative authority. Even so, the combining of the two types of authority to produce such a remarkable degree of deference is very interesting from a point of view of the study of the rhetorical power of combining the two types of authority.

It is a promising hypothesis to conjecture that both forms of fallacy may be due simply to undue deference, even though the argument from expert opinion type of fallacy may also be due to confusion between the two types of argument. Further research could test this hypothesis on examples on each form of argument, and in cases where an ambiguity between the two types of argument could be involved. Here it is also useful to note that such cases also possibly involve a third kind of authority distinguished by Weber (1958). In addition to legal authority depending on established laws of the state and traditional authority deriving from long-established customs and social structures, Weber also recognized what he called charismatic authority. He characterized this third kind of authority as an inspirational and personal authority claimed by a leader to derive from a higher, even divine power. But it is the first two kinds of authority that mainly concern us here, especially cases where they are combined as in the legal example above.

## 8 Classifying species of argument from authority

The meshing of the two kinds of argument raises the question of how to classify subspecies of argument from authority. At that point we raised the question of whether argument from expert opinion should be classified as a species of argument from authority. We raised some doubts about the system of classification because we worried that including argument from expert opinion under the category of argument from authority might confuse the issue of how to determine which instances of argument from expert opinion are fallacious. Generally speaking, arguments from expert opinion can be evaluated by using the appropriate critical questions matching the scheme for this type of argument and without bringing authority into it all. But nevertheless arguments from authority come into issues of how to deal with argument from expert opinion precisely because authority and expert opinion are connected in the fallacious cases in an important way. Our hypothesis is that identifying fallacies in certain instances of the use of the *ad verecundiam* fallacy arises from the confusion between the two schemes. This confusion is made possible or even likely because of the classification of both schemes as falling under the general category of arguments from authority.

But now some points have been clarified. We can now see that argument from expert opinion is a distinctive type of argument from authority in its own right once it is contrasted with arguments from deontic authority. In this regard it is helpful to classify arguments from expert opinion as falling under the more general category of epistemic arguments. This way this class of arguments can

be contrasted with deontic arguments, and so we are in a better position to see the two types of argumentation as distinctive and to be able to disentangle them in cases where the *ad verecundiam* fallacy has been committed.

We need to distinguish between administrative and deontic authority. The deontic category (in Bocheński's sense) is a broader notion than the administrative category. When Searle (2005) claims that (almost) every speech act has its deontic dimension (deontic powers), he refers to the broader sense of the term 'deontic'. So conceived, deontic powers may have diverse sources, not only administrative sources, but also social sources (such as dignity). For these reasons we classify argument from administrative authority as a subtype of argument from deontic authority. We indicated at the beginning of the paper that we are aware of the interchangeable use of 'deontic' and 'administrative.' For reasons of classifying schemes, we use the term 'deontic' to provide an argumentation scheme capable of grasping the broader class of arguments from authority that are not arguments from expert opinion.

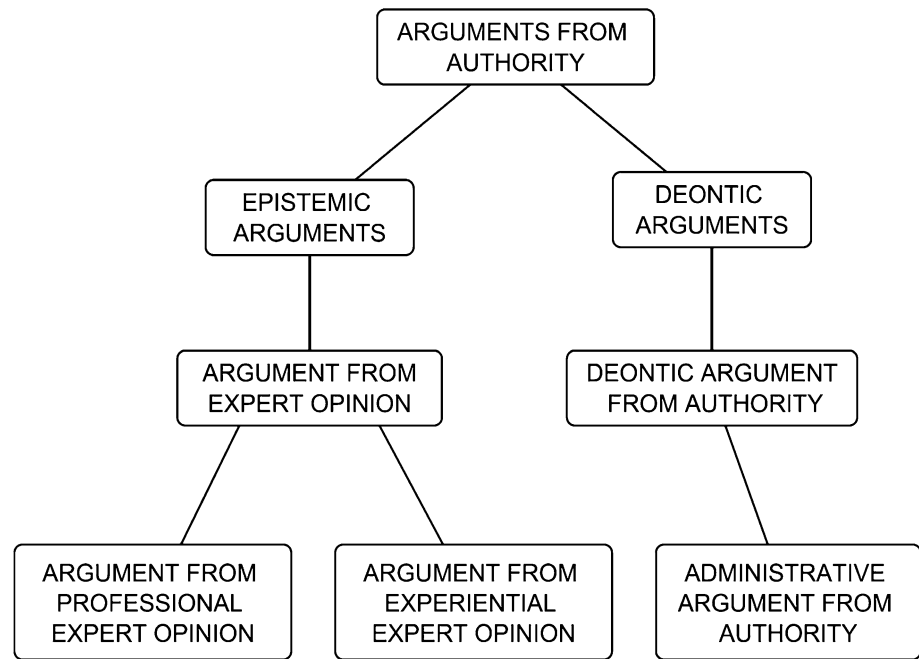
The classification system we propose is shown in Fig. 5.

This system follows the general classification system of schemes proposed by Macagno (2015), which treats the distinction between epistemic schemes and deontic schemes as fundamental for classifying all the schemes. In this basic classification system, even though there is no argumentation scheme for arguments from authority, both schemes, the one for argument from expert opinion and the one for deontic argument from authority fit under the general category of arguments from authority. This basic classification system can now be extended by research work in the future that might identify new related subschemes. This taxonomy is a contribution to the more general study on classification of argumentation schemes which is important for the field of argument mining (Macagno 2015).

## 9 Conclusions

We have argued that the distinction between the two types of authority may be drawn on the basis of identifying two different domains of authority. In case of epistemic or cognitive authority, the domain of authority is a set of propositions which are asserted, e.g., by an expert in a given field. In case of deontic or administrative authority, the domain of authority consists of, e.g., commands, requests, and advice. To supplement the argumentation scheme for argument from expert opinion as a device for argument evaluation, we have added a deontic scheme called argument from administrative authority. The capability to systematically distinguish between these two types of argument from authority has been shown to open

**Fig. 5** Basic classification system for arguments from authority



up new avenues for investigating the more serious instances of the *ad verecundiam* fallacy where the two types of argument are systematically confused. In particular we have provided a new foundation for investigating instances of the *ad verecundiam* fallacy where the argument from expert opinion is deployed to as a sophisticated tactic to try to get the best of a speech partner unfairly by suppressing his capability to ask appropriate critical questions.

We have also shown that an essential aspect of solving the problem of uncritical acceptance of expert opinions that is at the root of the *ad verecundiam* fallacy is the need to be wary to disentangle argument from expert opinion from the contrasting argumentation scheme for argument from authority. Although experts tend to be authorities, and to be so taken by those of us who have to depend on their advice, care needs to be taken to realize that an argument from expert opinion is inherently based on the assumption that the expert has specialized knowledge of the sort that cannot be accessed directly, at least without significant costs, but that can and often needs to be questioned and examined critically. The fallibility of arguments based on expert pronouncements needs to be kept in the forefront as a caution to prevent the natural tendency to treat what an expert says as the pronouncement of an authority that has a deontic right to command assent. The expert may be, and often is, an administrative authority, and therefore the user may have no choice but to go along with his pronouncement, or may face difficulties in trying to question it. A choice must always be made in a given case whether the cost of questioning the expert pronouncement of an administrative authority is worth pursuing. But if experts tend to be right far less often than we generally tend to

assume, the tendency to routinely or automatically acquiesce in the pronouncement of an expert may be just as likely to have costs attached.

Our approach allows us also to model another communicative phenomenon which is important from the sociological point of view, namely challenging authorities. We have pointed to the possibility of representing such challenges. The first way of challenging authorities is to ask critical questions. In this paper we presented the scheme and critical questions for an appeal to expert opinion, and we have introduced the new argumentation scheme for appeal to deontic authority (Sect. 5) with a set of critical questions that are used for challenging arguments from deontic authority (Sect. 6).

The second aspect of employing our proposal in challenging appeals to authorities may be seen in two figures discussed in this paper. The bottom part of Fig. 3 (Undercutting of Argument from Expert Opinion) represents possible challenges to expert authority. Next, Fig. 4 (An Expert Opinion Argument Undercut by an Administrative Authority Argument) is a representation of the two kinds of challenges of authority combined, namely the ‘epistemic challenge’ and the ‘deontic challenge’.

## 10 Directions for further research

Given possibilities of representing two types of challenges as discussed in the previous section, the future work needs to focus on a systematic exploration and representation of cases in which two types of challenges were performed.

The next direction for future inquiry could consist of linking the method of modeling the distinction between two types of authority as proposed in this paper with the work on online visualization of arguments. The theory that will be employed for this purpose is IAT (Inference Anchoring Theory; see Budzyska and Reed 2011) which describes communication structures that are represented by the argument mapping tool OVA + (Online Visualization of Arguments; Janier et al. 2014). IAT and OVA + allow us to (i) explore those dialogue moves that either support or attack epistemic and deontic authority by representing how argumentative structures are linked to dialogue moves, and (ii) model ethos (i.e., the character and credibility of the speaker) as ethotic structures (see also Budzyska 2013). Since these structures show how one's ethos is supported or attacked, they may be treated as a key component of appeals to authority, as authority-related arguments either strengthen or weaken ethos. IAT and OVA + will be used to enrich the inferential premise-conclusion structures related to appeals to authority (presented in this paper) by showing ethotic structures not only in argumentation, but in any type of speech acts. For instance, OVA + will allow us to identify *argumentum ad verecundiam* as a type of illocutionary force in a dialogue.

Another area of research that may be relevant is the project of building a conversational agent (CA), a computer program that can carry on a conversation with a human agent. Much of this work has been carried out by building embodied agents that have facial expressions and other attributes of a human body, but a new line of research concentrates on the dialogue itself, including the wording of the speech acts as well as the structural patterns of the sentences (O'Shea et al., 2008, 2009).

Given the affinity between the dialogical aspect of the CA studies and the epistemic–deontic distinction which manifests itself in a dialogue, future research could consist of showing how the distinction between two types of authority could possibly be incorporated in the CA research. One of possible lines of inquiry would be to distinguish conversational indicators that allow us to tell apart pure cases of (1) arguing from expert opinion (such as 'expertise', 'expert', 'knowledge') from (2) pure cases of arguing from deontic or administrative authority (such as 'follow the authority', 'you should do...'). Thus we may be capable of grasping the difference between cases in which the human–computer argumentation should lead us to accept statements (by appealing to epistemic authority related to knowledge) and cases in which quite a different outcome is expected, namely particular actions based on directives. As this paper has shown, the difference is quite important as it leads to different social phenomena

(accepting statements vs acting in line with given directives). Although we find this distinction applicable in the study of human–computer interactions, we should also keep in mind that there is a link between appeals to epistemic and appeals to deontic authority, namely in cases when the appeal to expertise is a foundation for formulating binding directives. We think that once linguistic indicators that allow us to distinguishing these two types or argumentative appeals are explored in details, the next step would be to show how linguistic indicators point to how the transition from epistemic to the deontic type of argument from authority might take place.

As we have also shown in this paper, explaining notions of authority can be assisted by seeing authority as a feature of norms (Raz 1979). Since norms indicate what should or what should not be done, studying the authority of norms (Veerbek 2007; Keren 2014) falls within the study of arguments from deontic authority. Accordingly, a possible aim of a future inquiry might be to examine the possibility of including the notion of authority of norms into the study of arguments basing on deontic authority.

Finally we suggest another direction for further research on links between argumentation schemes and fallacious appeals to authority along the lines of the theory proposed in this paper. This direction is to explore the relationship between the mechanism of fallacious cases of employing *ad verecundiam* argument scheme and current research strands in the study on rationality of pluralistic ignorance. In Bjerring et al. (2014) it has been argued that the phenomenon of pluralistic ignorance may arise "in a group of perfectly rational agents". Since we may observe some key affinities between social (and epistemic) mechanisms of forming pluralistic ignorance and the mechanism of relying on apparent authorities (which may be one of the reasons that rational agents strive at pluralistic ignorance), another interesting task for further inquiry would be to provide an answer to the question of how the argumentation scheme for appeal to authority and its fallacious uses are present in developing social mechanisms of collective ignorance.

To sum up, the work in this paper is part of a larger research project on the *ad verecundiam* fallacy, and we recognize that more work is needed to build on and supplement the research results of this paper. Nevertheless, we maintain that the results of this paper represent an important step forward in this larger research project. Further work is needed on case studies where the *ad verecundiam* fallacy appears to have been committed in order to build methods applicable to real examples of this kind. Formal and computational argumentation systems the scheme for argument opinion such as CAS, at their present state of development, can be applied to natural language examples

to help us to separate reasonable arguments from expert opinion and fallacious *ad verecundiam* arguments. But, as we have shown, they can be extended to handle more examples by carefully distinguishing between epistemic and deontic arguments from authority in the way shown in this paper.

The large project of providing the means for diagnosing and repairing fallacious appeals to authority cannot be completed by argumentation schemes alone, or even by formal and computational argumentation systems containing the scheme for argument opinion such as CAS. However, these systems do have the capability to go part way when extended even further by using formal dialogue systems to model properties of argumentation, recognizing for example that such dialogues have an opening stage, an argumentation stage and a closing stage. The essential characteristic of the sophisticated tactic type of *ad verecundiam* fallacy consists in a sequence of moves in a dialogue fitting the pattern of a device to force premature closure of the dialogue. Ultimately, we conjecture, full analysis of the *ad verecundiam* fallacy will not be achieved until the dialectical properties of this kind of argumentation can be modeled. Such a modeling includes the systematic study of the kinds of speech acts used as moves as a proponent puts forward the argument, the critical question or responds to it, and the sequence of argumentation continues as the proponent response to the critic. It also requires other tools that we are working on with the aim of moving the large project further along.

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