# ENTHYMEMES, ARGUMENTATION SCHEMES AND TOPICS

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Abstract
This paper argues for a reinterpretation of Aristotle's concept of an
enthymeme and also his wider informal logic in terms of arguments
that are defeasible. They are represented by forms of argument that
are called argumentation schemes, considered to be similar to forms
of argument found in deductive logic, but different from the forego-
ing in virtue of their being defeasible. Indeed, the most interest-
ing schemes have been put forward as a helpful way of characteriz-
ing structures of human reasoning that have proved troublesome to
model deductively. The paper sheds new light on Aristotle's topics
and how to define 'enthymeme'. If the traditional definition of an
enthymeme in logic accepted for over two thousand years is a mis-
nomer, the question is raised whether we ought to redefine it as a
defeasible argumentations scheme or leave things as they are.

Through recent studies in argumentation, the field of logic is expanding from
only using deductive and inductive models of reasoning to a more inclu-
sive approach also using semi-formal argumentation schemes. Defeasible
schemes of this sort can be used to identify, analyze and evaluate arguments
of the kind most commonly used in everyday conversational exchanges, as
well as in practical areas like legal reasoning and medical diagnostic rea-
soning. These schemes seem similar to Aristotelian topics, common forms
of argument that have been traditionally held to be important in both logic
and rhetoric. However the history of topics has been convoluted. The notion
of 'topic' has often been interpreted in different ways, and used for different
purposes in the history of rhetoric and dialectic. To make the history of these
subjects seem even more confusing, some have long contended that Aristotle
also used the term 'enthymeme' in a way that refers not to an unstated as-
sumption in argument, but to common forms of argument that we nowadays
call argumentation schemes. It is our aim to clarify these confusions.

Beginning with some examples of arguments described as enthymemes
by Aristotle, this paper examines the relationship between these arguments

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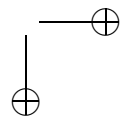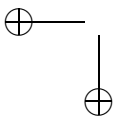
and topics. Next, a minority view concerning the interpretation of the Aristotelian enthymeme held by many influential scholars in logic and rhetoric, from Sir William Hamilton to Myles Burnyeat, is examined. According to this view, the Aristotelian enthymeme refers to a kind of plausible reasoning based on a defeasible generalization, one that can be defeated by exceptions. This minority view is opposed to the traditional view that an enthymeme is a deductive argument of the kind typified by a syllogism that has an unstated assumption as a premise or conclusion. The traditional interpretation of Aristotle's notion of the enthymeme, although it has been dominant in logic since the time of Aristotle, and still continues to represent the standard meaning of the term, begins to seem less and less plausible as argumentation schemes of the recently studied defeasible kinds come to be more widely accepted as indispensable tools for logical argumentation. Through these considerations the question is raised whether we should give into what has long been established English usage, or whether we should rethink our usage of the term 'enthymeme' in both logic and rhetoric.

According to an emerging view that has now become widely accepted both in argumentation and computing, rational argument admits not only the deductive and inductive types of inference, but also a third kind of reasoning called plausible or eikotic reasoning. This third type of argument is defeasible, based on generalizations that hold only tentatively, and are subject to defeat as new information comes to be known. A statement that follows from a set of premises based on an argument that is an instance of an argumentation scheme can be accepted, but may later need to be retracted if it is shown to be untenable by new evidence. Recent developments in logical argumentation, based on a viewpoint that accepts the usefulness of argumentation schemes (Walton, Reed and Macagno, 2008), suggest that it is common for these kinds of arguments to have implicit premises, and that schemes can often be used to find them. The problem is how these recent developments can be reconciled with the traditional interpretation of Aristotle's notion of the enthymeme, and with some new theories about Aristotle's use of the term 'enthymeme' that depart from the traditional interpretation.

1. *Argumentation Schemes*

In *The New Rhetoric*, Perelman and Olbrechts-Tyteca (1969) used everyday examples of arguments to study the different kinds of arguments used, and to classify them as various types. Many of the types they identified resembled Aristotelian topics. Warnick (2000) has compared the twenty-eight topics in Aristotle's *Rhetoric* with the thirteen argument schemes, or common types of arguments, identified in *The New Rhetoric*. In an appendix (pp. 120–128), Warnick set out a list, comparing the Aristotelian topic with

its counterpart argument scheme from *The New Rhetoric* (where available), giving an example of each. Argument from consequences, for example, is a very commonly used form of argumentation. As Warnick showed (p. 123), this form of argument was recognized as an argument scheme in *The New Rhetoric*, and also as a topic in Aristotle's *Rhetoric*. This development was very interesting, because Perelman and Olbrechts-Tyteca developed a new framework for analysis and evaluation for such commonly used types of arguments that seemed to indicate that rhetoric, and also the applied logic of everyday argumentation, are closely tied together. Their approach suggested that argument schemes can be identified and analyzed in an objective way. It suggested that there may be a way of evaluating commonly used arguments — arguments that are neither deductive nor inductive, in many instances — by identifying the form of the argument.

The study of argumentation schemes was advanced further by more recent attempts to identify and analyze commonly used forms of argument. Arthur Hastings' Ph.D. thesis at Northwestern University (1963) set out an extremely useful list of many of these schemes, along with illustrative examples. Recently Kienpointner (1992) has produced an even more comprehensive outline of many argumentation schemes, stressing deductive and inductive forms, and has analyzed instances of them in common examples. In other recent writings on argumentation, like van Eemeren and Grootendorst (1992), it has been shown how to use argumentation schemes to evaluate common arguments in everyday reasoning as fallacious or not. Kienpointner (1997) has shown how such argument schemes are useful for argument invention. In (Walton, 1996) an extensive list of argumentation schemes has been provided. Among the argumentation schemes presented and analyzed in (Walton, 1996) are argument from sign, argument from example, argument from commitment, argument from position to know, argument from expert opinion, argument from analogy, argument from precedent, argument from gradualism, and several types of slippery slope argument. These argumentation schemes are called presumptive, meaning that they are defeasible kinds of arguments. They are subject to default contextually in a given case, and so are inherently different from the context-free kinds of deductive and inductive arguments so long studied in logic. Each argument provides only a defeasible support for its conclusion, and is subject to critical questioning in a context of dialogue. Matching each form of argument (argumentation scheme) is a set of critical questions. The method of evaluating an argument of one of these types as used in a given case is to match the given argument against the requirements of the argumentation scheme. Then the weaknesses in the argument can be judged by asking appropriate critical questions. The method is dialectical, in that each given argument is judged in a context of use, in relation to a conversation between the proponent and a respondent (questioner, audience) to whom the argument was directed.

An example of an argumentation scheme (Walton, 1996; Walton, Reed and Macagno, 2008) is the form of argument called argument from expert opinion[1].

Major Premise: Source E is an expert in subject domain S containing proposition A.
Minor Premise: E asserts that proposition A (in domain S) is true (false).
Conclusion: A may plausibly be taken to be true (false).

Matching this argumentation scheme are six critical questions.

1. *Expertise Question*: How credible is E as an expert source?
2. *Field Question*: Is E an expert in the field that A is in?
3. *Opinion Question*: What did E assert that implies A?
4. *Trustworthiness Question*: Is E personally reliable as a source?
5. *Consistency Question*: Is A consistent with what other experts assert?
6. *Backup Evidence Question*: Is E's assertion based on evidence?

When an argument having the form of argument from expert opinion is encountered in a given case, an argument analyst can first of all check to see if it meets all the requirements for that form of argument (as set out above in the premises and conclusion). Then the argument can be critically evaluated by asking one of the appropriate critical questions from the above list. This is just one argumentation scheme and set of critical questions. But it shows how argumentation schemes represent common forms of defeasible argument that are extremely useful to know about.

Computational applications are making increasingly heavy use of schemes over the last few years, argumentation generally has been gaining increasing importance in multi-agent systems, as a vehicle for facilitating rational interaction of a kind that involves the giving and receiving of reasons. Tools like argumentation schemes are now proving to be useful for designing and implementing sophisticated forms of interaction among rational agents. A recent work (Walton, Reed and Macagno, 2008) provides a more systematic and comprehensive account of schemes with notation suitable for computational applications, and surveys the state of the art in the research efforts to formalize and classify the schemes.

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[1] It is also often called appeal to expert opinion in the logic textbooks.

2. *Aristotle's Topics*

Aristotle's *Topics* contains a set of so-called topics (*topoi*, or places) that describe different kinds of commonly used arguments. Aristotle listed a great number of these topics, about 300–400 according to Kienpointner (1992, p. 227). Many of these topics can also be found in Aristotle's *Rhetoric*. There has always been confusion, and many different opinions, concerning both the question of what a topic is exactly, and what uses a topic is supposed to have. Aristotle did not define the notion of topic. But two uses of topics have been seen as central, by commentators. The first use of topics is called invention (Kienpointner, 1997). According to this use, the function of a topic is to help an arguer search around to find an argument she can use, by selecting from among the various topics, or commonly used types of arguments. The second use, which tended to be stressed by later medieval commentators, is the guaranteeing or warranting function (Kienpointner, 1992, p. 226). According to this use, the topic can be used to find the warrant needed to support the inference from the premises to the conclusion of a given argument. The second use seems more like a logical function, while the first use seems to be more of a rhetorical function. For two millennia, these topics seemed very interesting to scholars in both rhetoric and logic, but the commentators never seemed quite sure what to do with them, or to figure out how they should be used. It is fair to say that the topics have never been an unqualified success as a useful tool in either field. The problem seemed to be that there was no general theory of argument that could provide a systematic context in which the topics could be embedded. Leff (1983) observed that the connections made by the topics are relative to the arguments addressed, and are verified with reference to social knowledge shared by a speaker and hearer. But the framework needed to verify or rationally support an argument on this basis has, in the past, seemed beyond our reach. Logical positivism, a view that was popular during the development of deductive logic in the early twentieth century, would dismiss such a view of argument as "subjective". Thus the topics always seemed very interesting, but elusive and mysterious. They were never really useful as a set of analytical tools that could be effectively used either in logic or rhetoric. The resources for showing how topics could be used for either the invention or the warranting function were unavailable.

That is changing now, as recent research (Rigotti, 2007) is taking a closer look at the topics to see how they could be refashioned and integrated with the latest developments in argumentation theory. On this new approach, topics are linked with enthymemes and also with common knowledge. There is plenty of evidence that Aristotle was very much aware of forms of defeasible argument based on common knowledge, and was also aware of a syllogistic-like technique for modeling their inferential structure. To see this,

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it is necessary to consider the highly controversial notion of the Aristotelian enthymeme.

3. *The Aristotelian Enthymeme*

A fascinating, but puzzling aspect of Aristotle's writings on argumentation is that, especially in books two and three of the *Rhetoric*, he often describes these defeasible types of arguments that seem to be topics as "enthymemes". These so-called enthymemes are what we would now call plausibilistic arguments of the kind that fit argumentation schemes. They are not deductive arguments, or inductive arguments in the modern statistical sense. Aristotle gave many examples of these plausibilistic inferences based on warrants that hold for the most part, and not universally. Burnyeat (1994) cited a number of such examples of these arguments called enthymemes by Aristotle. One is a kind of inference form that Aristotle used to prove a point about the past (slightly modified from Burnyeat, 1994, p. 25):

(Inf.): If individual x was able and wished to carry out action A, then x carried out action A (2.19.18–19).

This rule of inference is not (absolutely) universal. Aristotle wrote that "people do, for the most part, what they want, provided they are able." (Burnyeat's translation, p. 25). So (Inf.) represents what could be called a defeasible generalization. It is a kind of warrant that could be used in a plausible inference. How it would typically be used is in an abductive inference. In a given case, say a legal case, we may know that Bob was able to carry out action A and wished to carry out action A. At least we may have evidence that this is so. But we may not know who carried out action A. The evidence about Bob's motives and wishes would count slightly towards the hypothesis that it was Bob who carried out action A. At least that hypothesis may be the best explanation of the given data. In law such an inference might have some "probative weight", even though the inference is defeasible, and could easily be defeated by other evidence in a case.

Another example of an argument called an enthymeme by Aristotle (2.19. 24, 1393a6–7), and cited by Burnyeat (1994, p. 26) in his analysis of the Aristotelian enthymeme is the one below. It is not part of an abductive argument, but would be part of a prediction. It is a typical case of argument from sign.

(C): If the sky is clouded over, it is likely to rain.

Here the consequent is qualified by the term "likely". Burnyeat (1994, p. 29) shows how this conditional could function as a kind of generalization in a syllogistic-like inference like the following one. We have changed Burnyeat's wording slightly.

For the most part, cloudy days turn out to be rainy days.
This day is a cloudy day.
Therefore this day is likely to turn out rainy.

The argument in this case is prediction. Unlike the argument about Bob, which was a retrospective, abductive inference from data about an action that occurred in the past, this argument is a guess about the future. But, like the previous argument, this one is also defeasible. It gives a reason to support the conclusion, in the absence of stronger contrary evidence, but does not prove beyond questioning that the conclusion is true. As Burnyeat pointed out (p. 28), the conditional (C) could be counter-balanced by an opposing consideration.

(C$'$): If the barometer is high, it is likely not to rain.

In a given case, we could have two *modus ponens*-like arguments opposed to each other. One has C as premise, along with the premise that in fact the sky is clouded over today. The other has (C$'$) as premise, along with the premise that the barometer is high today. The conclusion of the first argument is the opposite (negation) of the conclusion of the second argument. As Burnyeat (1994, p. 28) comments on this kind of case, the two conclusions "contradict each other". But suppose we look at both arguments as defeasible arguments from sign. Looked at in this way, there need be no final or closed contradiction between them in a particular case. For we could say that in such a case the one conclusion is supported by one piece of evidence, while the other (opposite) conclusion is supported by another piece of evidence. Such an evidential situation, for example, is typical of legal cases of the kind disputed in court. A mass of evidence on one side supports the contention on the one side, while a mass of evidence on the other side supports the (opposed) contention on the other side. In such cases, it is normal to find plausibilistic, defeasible arguments on two (opposed) sides of an issue. Thus one can see by comparison to how evidence is used in typical legal cases that these defeasible arguments that represent what Aristotle may have meant by 'enthymeme' are extremely common and are vital to understanding how argumentation works in important cases.

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So what then is the relationship between topics and these common forms of argument that Aristotle classifies as enthymemes? Are topics and enthymemes really just different terms that refer to the same kinds of arguments that would nowadays be called argumentation schemes? Is 'topic' just another word for argumentation scheme, perhaps? Is 'enthymeme' just a fancy term to stand for the kinds of actual arguments that fit argumentation schemes? These questions are highly controversial, not only to Aristotle scholars, but also in relation to recent developments in logic and rhetoric. As shown below, the term 'enthymeme' has long been taken to mean something different from the kind of plausibilistic arguments cited above by Burnyeat. There is now strong evidence that this traditional interpretation was a seriously flawed and misleading representation of Aristotle's theory of argument.

4. *Enthymemes and Eikotic Arguments*

What Aristotle meant by 'enthymeme' is more than just a technical problem of translation and textual interpretation for specialists in history, classics and Greek philosophy. One reason is that Aristotle is the founder of logic, and also in many important respects the definitive author on rhetoric. Another reason is that Aristotle's view of both subjects is unusual, and goes strongly against the current longstanding conventional wisdom, in that he saw the two subjects as so closely connected. The current situation is that there is a growing interest in what was long regarded as a dead subject — Aristotle's informal logic (as opposed to his theory of the syllogism), as found mainly in the *Topics*, *On Sophistical Refutations* and *Rhetoric*. At the same time, this flourishing of informal logic, or argumentation theory, to use a broader term, has captured the interest of many of those working in the field of communication, and especially rhetoric. There is also a conflict, or an apparent conflict anyhow, between the advocates of formal logic and the advocates of informal or applied logic. Such a climate of opinion demands a rethinking of the Aristotelian doctrine of the enthymeme, if any sense is to be made of the relationship between rhetoric and dialectic.

According to the accepted definition in logic, an enthymeme is an argument with a missing (unstated) premise or conclusion, such that once the missing part is supplied, the argument becomes valid. For example, Hurley (2003, p. 289) defines an enthymeme as "an argument that is expressible as a categorical syllogism but that is missing a premise or a conclusion." Hurley (p. 289) gives the following example: "The corporate tax should be abolished; it encourages waste and high prices." According to Hurley (p. 289), the missing premise is, "Whatever encourages waste and high prices should be abolished." This account, which could be called the traditional view of

the enthymeme, can be found in many older and current logic textbooks. This traditional view of the enthymeme is often attributed to Aristotle. And it is true that the word 'enthymeme', or the Greek term *enthymema*, meaning 'in the mind', is prominent in Aristotle's *Rhetoric*. But when Aristotle used the term, was he referring to a syllogism with a missing premise or conclusion? Although the majority in logic think he was, or at least have tended to take it for granted that he was, there is a minority view that has been expressed from time to time. Sir William Hamilton (1861) called the traditional view of the enthymeme a "vulgar doctrine" (p. 153). According to Hamilton (1874, p. 389) an Aristotelian enthymeme is a syllogism based on "signs and likelihoods". Hamilton argued that not all Aristotelian syllogisms are of the deductively valid kind. He argued, convincingly: "a syllogism from signs and likelihoods does not more naturally fall into an elliptical form than a syllogism of any other matter."(1874, p. 389). Hamilton argued that you can have an Aristotelian syllogism, for example one based on argument from sign, where the inference from the premises to the conclusion is not logically necessary. An enthymeme, on this view is a kind of syllogistic-like inference based on a warrant stating that something generally appears to be true, subject to exceptions.

H.W.B. Joseph (1916, p. 350) later made the same point when he claimed that 'enthymeme', as used in logic to refer to a syllogism with a missing premise, does not represent Aristotle's meaning of the term. Joseph, like Hamilton, thought that Aristotle was referring to a kind of inference based on a defeasible generalization, one that can be defeated by exceptions. According to Joseph (p. 350), *eikos* is "a general proposition true only for the most part, such as that raw foods are unwholesome." Eikotic generalizations are subject to exceptions, Joseph argued, and eikotic (enthymematic) inferences based on them hold only tentatively. Joseph (p. 350) cited arguments used in medical diagnosis as examples of enthymemes in the proper sense meant by Aristotle. The symptoms point eikotically to a diagnosis as conclusion of an inference, but the eikotic inference can be defeated when new test results come in.

McBurney (1936) argued that the enthymeme in Aristotle is not essentially an argument with a missing premise or conclusion. According to McBurney (1936, p. 56) there is great difficulty in grasping what Aristotle meant by 'enthymeme', because Aristotle's remarks on the enthymeme are "obscure" and "he does not give us a complete example." The same could be said about Aristotle's meaning of the term *eikos*. As Whately (1863, p. 33) remarked, we have to guess what Aristotle meant by *eikos*, because "unfortunately he has not furnished any example of it." But the notion of argument based on

eikos was highly familiar to Greek philosophers and rhetoricians, and particularly to the sophists. The problem is that using the English word 'probability' (which came via the Latin) to translate this notion is highly misleading. To the modern English reader it suggests the probability calculus, and what we would nowadays associate with inductive or statistical reasoning. A much less misleading translation would be to use the term "plausibility". A good illustration of plausible reasoning is the example described by Aristotle in the *Rhetoric* (1402a17–1402a28). A smaller, weaker man was accused of assaulting a bigger, stronger man, and the case went to court. The smaller man asked the jury whether it is plausible that he would have assaulted the visibly bigger and stronger man. Needless to say, this argument would carry some weight with a jury. It is not conclusive, and is very much conjectural. It seems to be based on the jury's ability to put themselves in the situation of the smaller man. But the argument does shift the balance of evidence somewhat against the side of the larger man. However, a comparable plausible argument could also be used to shift this balance somewhat back the other way. The bigger man could ask the jury why he would attack the visibly smaller man, since such an attack would make him look so guilty in court. This example shows how the eikotic type of argument fits in with kinds of argumentation favored by the sophists. According to Gagarin (1994, p. 51), the reverse eikotic argument was a typical "turning-of-the-tables" argument of the sophists of the second half of the fifth century BC.

One begins to wonder then, if the Aristotelian enthymeme does refer to eikotic argument and not (essentially or exclusively) to arguments with unexpressed parts, could a new and different meaning also be given to the famous Aristotelian "topics". McBurney (1936) showed that many of the various Aristotelian topics, or common argument types, are plausibilistic or eikotic arguments. These forms of argument are familiar to modern argumentation theorists, where they are called "presumptive argumentation schemes". Tindale (1999, p. 11) noted that many of the topics outlined by Aristotle in Book II chapter 23 of the *Rhetoric* are the same as, or similar to the defeasible forms of argument now called argumentation schemes. Examples are argument from precedent, argument from consequences and argument from analogy. Sometimes these topical or eikotic form of argument are called "stereotypes" (Boss, 1979, p. 24), because they "derive from personal or vicarious experience" that an audience brings to an argument. In that sense, as Bitzer (1959, p. 407) pointed out, the term 'incomplete syllogism' does "very nearly represent" what Aristotle mean by enthymeme, in a special sense. In Bitzer's view (p. 408) enthymemes are jointly produced by an arguer and the audience or respondent to whom the argument is addressed. On this interpretation, what essentially characterizes an Aristotelian enthymeme is a kind of common knowledge, often a practical grasp of the way things normally go in common situations, shared by the speaker and audience.

5. *Burnyeat on the Enthymeme*

A recent controversy swirls around the definition of the enthymeme given in the *Prior Analytics* 2.27 (70a10), where an enthymeme was said to be an incomplete (*ateles*) *sullogismos* from plausibilities or signs. One major controversy is whether Aristotle ever actually wrote the word *ateles* in the original manuscript, or whether it was inserted by a commentator. There is evidence for both contentions. Another problem concerns the word *sullogismos*, which is often translated as 'syllogism'. However, according to Burnyeat 1994), 'syllogism' was definitely not meant by Aristotle. Burnyeat cites the passage in the *Topics* (100a25–27) where Aristotle wrote that a *sullogismos* is a discourse (argument) "in which, certain things being posited, something different from the things laid down necessarily results through the things laid down." The word 'necessarily' suggests that *sullogismos* refers to deductive reasoning. The problem is then to try to figure out how a *sullogismos* that is an enthymeme could have included plausibilistic reasoning as well as deductive reasoning. Or if this is not possible, according to the way Aristotle used these terms, how could an enthymeme be a kind of *sullogismos*, a kind of reasoning that comes under the general heading of *sullogismos*, even though it is not deductively valid reasoning. These matters are highly controversial among Aristotle scholars, and should not be regarded as settled, one way or the other. Burnyeat has shown that there is quite a lot of apparently quite good evidence on both sides. He has also shown exactly how the traditional, strict interpretation began to fall into place quite early, in ancient times. His work vindicated the relaxed theory considerably, and shown how, at very least it is on a strong basis as a contender for interpreting what Aristotle meant by 'enthymeme'.

Alexander of Aphrodisias, perhaps the earliest defender of the view of the view that the enthymeme is an incomplete Aristotelian *sullogismos*, wrote a commentary on the *Topics* at the time a certain logical controversy was being disputed by the philosophers of the day (Burnyeat, 1994, p. 46). The syllogism has to have two premises, but Antipater had argued for the existence of one-premises arguments like, "You breathe, so you are alive." Thus a kind of philosophical problem seemed to be posed to Alexander. How could he defend the theory of the syllogism against what appears to be an objection to it? For if one-premised arguments like those cited by Antipater do really represent some kind of logical reasoning, how is it that they can't fit into the theory of the syllogism? Alexander replied that such an argument is incomplete, because the missing premise is "well known and evident" (Burnyeat, 1994, p. 46). Alexander postulated the existence of "rhetorical *sullogismoi*" like "This man deserved punishment, for he is a traitor." Alexander wrote that they "seem to be *sullogismos*, because the missing premise is sufficiently well known to be supplied by the audience, but they are not in the proper

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sense *sullogismoi*.” (Burnyeat, 1994, p. 46). This historical evidence has highly significant implications, not only for interpreting what Aristotle might have meant by 'enthymeme', but also in relation to recent developments in logic and argumentation theory.

Burnyeat cited many examples of non-strict generalizations and inferences found in Aristotle and other ancient sources that are very interesting in their own right. Many of them can now be recognized as instances of defeasible, plausibilistic reasoning of the kind now so widely studied in computer science under the headings of default reasoning, abductive inference and nonmonotonic reasoning. Now we recognize these as an important class of arguments in their own right, and as different from deductive arguments, the relaxed interpretation of the Aristotelian enthymeme can be seen as both more plausible and more significant in the history of logic and rhetoric. But as well, the controversy between the views of Antipater and Alexander has even deeper implications about how the enthymeme should be understood.

Consider once again Antipater's argument, “This man deserves punishment, for he is a traitor.” Is it really the same argument as Alexander's syllogism: 'All traitors deserve punishment; this man is a traitor; therefore this man deserves punishment.'? There are two sides to this controversy. On the one side, you can argue that they are the same argument, or can be so treated, for two reasons. One is that the missing premise, 'All traitors deserve punishment.' is a generalization that may not be strictly true, and may be defeasible, but that would be accepted by an audience (certainly an ancient Greek audience), as a premise that is well known and evident. The other reason is that once this missing major premise is inserted into the given abbreviated argument, the new argument becomes if not valid, at least an argument that carries weight as plausible. As such, arguably it could be said to have a structure that makes it rationally binding in somewhat the same way some deductively valid arguments are binding. If you accept the premises, the argument gives you a reason to accept the conclusion. Now, what about the other side? Speaking for Antipater, he might be disinclined to accept this argument. The reason he could give is that, in his opinion, his original argument and Alexander's syllogism are not the same argument. In his original argument, the audience goes directly from the premise to the conclusion. In Alexander's syllogism, the audience goes from the two premises, one of which is a generalization, to the conclusion. Antipater could insist that these two arguments are not identical, and that therefore the theory of the enthymeme as an incomplete syllogistic argument is wrong. In our opinion, the controversy posed here is a legitimate philosophical dispute on which there are two sides, and which is significant for logic and rhetoric as fields that concern the analysis of arguments. This ancient dispute is not only a matter of interpreting Aristotle, but also a matter of some importance for

argumentation theory, informal logic and rhetoric, as fields that study and evaluate natural language arguments.

The foregoing investigations into the Aristotelian enthymeme have shown that it is a reasonable hypothesis that Aristotle was not only aware of eikotic arguments as a special class of arguments that are vitally important in both dialectic and rhetoric. It begins to look quite plausible that the topics are quite similar, in their function and role in both fields, to argumentation schemes. If these two hypotheses are right, then not only do we need to rethink Aristotelian rhetoric and dialectic. The new interpretation of Aristotle's philosophy of argumentation also throws a new light on the new rhetoric and the new dialectic. We can see both subjects as centrally concerned with argumentation schemes. On this view of the matter, dialectic and rhetoric become subjects that are very closely related. They not only share much common subject matter, but also share common methods, structures and techniques.

6. *The Strict Theory versus the Inclusive Theory*

There are many historical and philosophical questions about the Aristotelian enthymeme that remain to be answered. Where did the misinterpretation begin among the commentators on Aristotle? Why has it persisted so long as a central dogma in the history of logic? Should we give in to what has become established English usage, or should we use another word to stand for arguments with missing premises (or conclusions)? The situation is peculiar, and calls out for an explanation. (Hamilton, 1874, p. 389) remarked, "this absurdity has been and almost universally is believed of the acutest of human intellects, and on grounds which, when examined, afford not the slightest warrant for such a conclusion." Hamilton wrote (1861, p. 155) that the "vulgar doctrine" of the enthymeme started from the earliest Greek commentators on Aristotle, and can be traced through Sextus Empiricus. But even if that explains how it originally happened, it should also be asked why it was so prevalent for so long.

It could be fairly said that there are two theories or views about Aristotle's concept of the enthymeme. One could be named the traditional or strict theory. According to this theory, an enthymeme is a syllogism, or some argument that has a deductively valid form, once a missing premise or conclusion is inserted. The characteristic of this theory is the view of the enthymeme as being essentially a deductive kind of argument. A secondary version of it could also admit of enthymemes that are inductive, in the modern statistical sense, not the Aristotelian sense of the term 'inductive'. The other could be called the inclusive theory. According to this theory, an enthymeme is an argument with a missing premise or conclusion, but it could either be a

deductive or inductive argument, or an argument of a third kind. What is characteristic of an enthymeme of this third kind is that it is a plausibilistic and defeasible argument based on a warrant that holds generally or typically, in a familiar kind of case, but is subject to exceptions in some cases. A good way of presenting the difference between the two theories is to explain the difference between two kinds of generalizations. One type is the (absolute or strict) universal generalization modeled by the universal quantifier in deductive logic. It says that all F are G, where F and G are classes, meaning that all members of F are members of G. This type of generalization does not admit of exceptions. One counter-example falsifies it. If you find even one single F that is not a G, then the generalization 'All F are G' fails. The second type of generalization is inductive. The third type of generalization is the plausibilistic or defeasible type. It says that generally F's are G's, in typical or normal cases, but allows for the possibility of new cases cropping up in which there is an F that is not a G. In such a case, the generalization "defaults", meaning that it does not apply to that case. But the generalization is not proved false by such a case. It still holds generally. It can still hold, because its holding was always understood, in the beginning, to be subject to exceptions. The problem with traditional logic is that generalizations tended be equated mainly with the strict type of quantifier ones, and the non-strict ones were not recognized. However, as the non-strict defeasible generalizations gained more and more recognition as important in both computer science and argumentation theory, there has come to be more of a balance between those who do recognize them as a legitimate category in logic and those who still do not recognize them.

Many of the most common generalizations in everyday argumentation are not of this strict or absolute type. They are about the way things can typically be expected to go in a familiar or normal kind of case, subject to exceptions. For example, the generalization 'Birds fly.' is not shown to be false by the existence of a single counter-example. Penguins are birds that don't fly. And some birds with damaged wings don't fly. But generally, or for the most part, birds fly. The same remarks can be made about the *modus ponens* type of inference. Where A and B are statements, *modus ponens* has the following form: if A then B; A; therefore B. In the past, *modus ponens* has been seen as a deductively valid form of inference. Indeed, the conditional in classical deductive logic is defined in such a way that *modus ponens* must come out valid. The conditional 'If A then B' is false if A is true and B is false. Most conditionals of the kind used in everyday argumentation are not of the strict kind. Instead, they state something more like, 'If A is true then generally (but subject to exceptions) B is also true.' For example, the conditional 'If x is a bird then x flies.' can be taken to express a defeasible conditional. Defeasible forms of argument are based on defeasible generalizations and defeasible conditionals. There are defeasible *modus*

ponens arguments and defeasible arguments that are syllogistic-like. The various argumentation schemes are generally, and for the most part, based around such non-strict argument forms, using defeasible generalizations and conditionals. Argumentation schemes can represent forms of argument that are deductively valid in some cases. Under conditions of epistemic closure, where a data base is regarded as complete, such inferences can be seen to be deductively valid. But far more common in everyday argumentation are cases of reasoning under uncertainty. In such cases, new evidence can come in. Thus the form of argument is better seen as defeasible. In short, the use of argumentation schemes points to a new way of looking at arguments that is quite different from the old way based on the deductive paradigm. But of course the new way is also old, if Aristotle's doctrines of topics and enthymemes can be interpreted as referring to argumentation schemes.

7. *Conclusions*

For a long time, Aristotle's logic of topics has been viewed in a distorted way. Once they are seen in light of the new methods currently being developed in argumentation and computing, and especially the work on argumentation schemes, Aristotle's writings on rhetoric and dialectic can be seen in a new light. When we read through his analysis of the various enthymemes, for example in the *Rhetoric* (1402a25), we can link his discussion of genuine and apparent enthymemes to the study of fallacies. Genuine enthymemes are the kinds of reasonable eikotic arguments associated with topics (argumentation schemes). Apparent enthymemes are the fallacious uses of these same forms of arguments. This critical pragmatic view of the *Rhetoric* makes it not only fit in with the discussions of argumentation in the *Topics* and *On Sophistical Refutations*. It makes the subjects of rhetoric and dialectic fit together seamlessly, in a way that makes Aristotle's writings on these subjects much more useful and interesting than they were when they were seen from the traditional logical viewpoint.

But what is at issue is more than just the question of how Aristotle should be interpreted, or even how the history of the notion of an enthymeme in rhetoric and dialectic should be told. What is at issue is how we should look at the meaning of the term 'enthymeme' in logical argumentation now, in light of the findings shown above. Recent work in logical argumentation studies on the concept of enthymeme, even though informed about the terminology matters analyzed in this paper, has still continued to follow the definition of an enthymeme as an argument with the premise or conclusion that was not explicitly stated in the given text of discourse (Walton, 2008). Should this tradition be continued? Following this observation and our other findings, we offer the following recommendations.

- Since the traditional meaning of the term 'enthymeme' as an argument with a missing premise (or conclusion) is so well established in logic, this usage should broadly be retained, with the following important qualification.
- In addition to taking into account deductive arguments with missing premises or conclusions, the new conception of enthymeme should take into account arguments with missing premises or conclusions that are based on argumentation schemes that are defeasible, like the one for argument from expert opinion.
- What was very likely the original Aristotelian meaning of the term 'enthymeme' according to Burnyeat's theory, should not be carried over into current studies of logical argumentation, since the language of defeasible argumentation schemes, for example as found in (Walton, 2008) already covers that concept.
- What Aristotle called enthymemes, on Burnyeat's theory, should be called plausibilistic arguments, as opposed to probabilistic argument of the Bayesian kind familiar in probability and statistics.
- Despite the three points above, practitioners of logical argumentation should be aware of Burnyeat's theory, and what it suggests, namely that Aristotle was well aware of the importance and uses of defeasible argumentation schemes.

The narrow confines of traditional logic are already being expanded from the strict approach of only using deductive logic and inductive models of reasoning to a more inclusive approach that also uses plausibilistic argumentation schemes of the kind we discussed. Such schemes are now widely used to identify, analyze and evaluate arguments of the kind commonly used in everyday conversational exchanges, as well as in practical areas like legal reasoning and medical diagnostic reasoning (Rigotti and Greco, 2006). Arguments of this kind can only be usefully analyzed and evaluated once implicit premises and conclusions in them are identified and taken into account. Our recommendation is that we should continue to use the term 'enthymeme' in the way we have, rather than on insisting that we should call them "incomplete arguments", or invent some new term. It may be that the history of logic is based on a misnomer, but now the terminology has been so well and so long established, it is better, on a balance of considerations, to stick with it.

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