

## Enthymematic Arguments

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A recurrent theme in theoretical treatments of argument—such as those of Perelman (1958: 83-99), Toulmin (1958: 98, 100), Hamblin (1970: 235, 238, 245) and van Eemeren and Grootendorst (1984: 119-149)—is the tendency of most arguers to leave implicit an assumption in virtue of which their conclusion follows from their premisses. Outside carefully articulated philosophical and mathematical reasoning, in fact, most arguments are deductively invalid in the sense that the meaning of their constituent statements leaves open the possibility that their premisses are true and their conclusion false. Some of these deductively invalid arguments are appropriately appraised by a non-deductive standard of inference appraisal; they are “inductive” or “conductive” or “abductive” arguments. Some are obvious *non-sequiturs*, to be rejected out of hand. The rest are the topic of this paper.

These arguments, then, are deductively invalid, but not mere *non-sequiturs* and not non-deductive arguments either. Let us call them “enthymemes” or enthymematic arguments, after the name borrowed from Aristotle in traditional “Aristotelian” logic for syllogisms in which a premiss (or the conclusion—but I exclude such cases) is omitted.

Two problems arise about such arguments. The **demarcation problem** is to distinguish enthymemes from deductively valid arguments on the one hand and mere *non-sequiturs* on the other. (I assume for the sake of this discussion that there is some way of separating off arguments whose inference is appropriately appraised by a non-deductive standard, and I ignore any problem

of “missing premisses” which may arise among such arguments.) The **evaluation problem** is to work out how to evaluate the inference in an enthymematic argument.

Although enthymemes are common and their recognition goes back at least to Aristotle (**Rhetoric** I 2 1357a17-19), there is at present no adequate solution to these two problems. To be sure, traditional logic, as represented by such authors as Barker (1965) and Copi (1982), has solved them for incomplete categorical syllogisms, and Duthie (1975) has extended these solutions to a broader logic of terms. And Rolf George (1972, 1983) has, though I believe with insufficient supporting argument, supplied solutions for propositional logic and first-order predicate logic. But there is no extant general solution for either problem. It is not an adequate solution to the demarcation problem, for example, to say that an enthymeme is an argument with a missing premiss, for we need criteria for determining when a premiss is missing. Besides, some authorities (Bolzano 1837, Ryle 1954, Toulmin 1958, George 1972, 1983) deny that enthymemes have missing premisses, and I shall later defend this denial. Nor is it an adequate solution to the evaluation problem to say, as Trudy Govier does, that you add a missing premiss whose addition “you can justify...with reference to the wording and context that is actually there” (1985: 33) and evaluate the resulting argument. For we need criteria for an adequate justification of the additional premiss on the basis of the original argument’s wording and context.

I intend, therefore, to propose and defend a general solution for natural languages of these two problems.

### Deductive Validity in Natural Languages

The first step in distinguishing enthymemes from deductively valid arguments on the one hand and mere *non-sequiturs* on the other will be to define deductive validity for natural languages. The concept of deductive validity is well defined within formal systems constructed using the logistic method (Church 1956: 47-58). An argument expressed in a formal system **K** is syntactically valid if and only if it is provable within **K** that its conclusion is a consequence of its premisses. And the argument is semantically valid under a specified interpretation of the system's connectives and operators if and only if no assignment of values to the argument's constants makes its premisses true and its conclusion false under the specified interpretation of the connectives and operators.

One could therefore define deductive validity for arguments in natural languages with reference to deductive validity within a formal system. On such an approach, a deductively valid argument in a natural language would be an argument which is correctly translated into an argument which is semantically valid in a formal system with a specified interpretation of its connectives and operators. Given the difficulties of such translation, however, and the probable need for as yet undeveloped formal systems, it seems appropriate to advance a conception of deductive validity which can be applied directly to arguments in natural languages. Such a conception would have to be a semantic rather than a syntactic one, since natural languages do not come equipped with a complete set of primitive syntactically expressed rules for deductively valid inference.

The constants in formal systems are the analogues of what we might call **atomic content expressions** in natural languages. Such expressions, the categorical terms of medieval logic, can be regarded as referring to or otherwise signifying actual or possible features of the universe: entities, qualities,

occurrent states, dispositions, events, relationships, times, places, facts, and so forth. Natural languages thus have a built-in apparent categorial scheme, which could in principle be made explicit. (Revisionary ontologists can reject such apparent categorial schemes by providing functionally equivalent paraphrases into a canonical notation, in the fashion of Quine, or by producing some other account of how language relates to reality.) **Content expressions** can be defined in terms of this apparent categorial scheme as expressions which in the context of their utterance can be regarded as referring to or otherwise signifying an item in a category. A **molecular content expression** is a content expression which has as a proper part an expression which is a content expression. An **atomic content expression** is a content expression which is not molecular.

From a given sentence, it is possible to construct a sentence of the same **form** by substituting for one or more of the content expressions a content expression in the same category. (I originally introduced the term "category" for categories of items; by extension, one can speak of the category to which belongs an expression signifying an item in a category.) Thus, the sentence "The dog is on the mat" is of the same form as the sentence "The cat is on the mat" because it can be obtained from that sentence by substituting "dog" for "cat". Let us define **substitution on a content expression** as "replacement of that content expression by a content expression in the same category". (We allow as a degenerate case substitution of a content expression by itself.) Further, by **uniform substitution on a content expression** let us mean "replacement of all occurrences of a content expression by the same content expression, one in the same category as the original." (It is to be understood that the expression has the same meaning at all occurrences; where the expression has different meanings at different occurrences, we treat these as occurrences of different content expressions.) The **atomic form** of a sen-

tence (or set of sentences) can be regarded either as the set of sentences (or of sets of sentences) obtained by uniform substitution on all the atomic content expressions in the original sentence (or set of sentences) or as a schema which each member of the set instantiates.

An argument which is formally deductively valid is one whose (atomic) form makes it impossible for its premisses to be true and its conclusion false. We can give some precision to the notion of an argument's form making something impossible, in the following way: An argument is **formally deductively valid** if and only if no uniform substitution on the argument's atomic content expressions produces an argument with true premisses and a false conclusion.

It may be objected that an attempt like this to define formal deductive validity for natural languages is bound to fail, because at least some natural languages have grammars which are not logically perspicuous, in the sense that sentences of the same grammatical form have different logical forms. Thus, for example, there follows from the premisses that "That dog is mine" and "That dog is a spaniel" the conclusion that "That dog is my spaniel", but from the premisses that "That dog is mine" and "That dog is a father" it does not follow that "That dog is my father". (Cf. Plato's **Euthydemus** 298d-e.) In general, however, such apparent counter-examples to the definition involve the substitution of a content expression of a different category; in the example, "spaniel" signifies a kind of entity but "father" a relationship.

The proposed definition of formal deductive validity has at least two virtues, in addition to its immediate applicability to natural languages. First, it brings out the attraction of formal deductive validity as a criterion of appraisal for arguments: it is truth-preserving. The conclusion of any formally valid argument with true premisses will also be true. In cases where the premisses are not known with cer-

tainty to be true, but merely accepted as true on the basis of more or less adequate evidence or argument, the argument does not give us certain knowledge of the truth of the conclusion, but provides some basis for transferring the acceptance we give to the premisses to the conclusion (subject to countervailing considerations from other evidence and arguments). Since one function of arguments is to increase our stock of truths, or at least of well-grounded beliefs, formal validity is a sufficient criterion of inference soundness.

Secondly, it provides a quick way of showing that an argument is formally invalid. One simply constructs a parallel argument, obtained by substitution on the original argument's atomic content expressions, in which the premisses are true and the conclusion false. (Let us call such a parallel argument a **counter-example** to the original argument.) Suppose, for example, someone argues that nuclear weapons have prevented a war between the superpowers, on the ground that there has not been a war between the superpowers since they both got nuclear weapons. The conclusion does not necessarily follow, one might reply: You might as well say that new cars have prevented a fight between the neighbours, on the ground that there has not been a fight between the neighbours since they both got new cars. It is more difficult to demonstrate formal validity using the proposed definition as a criterion, since the failure to produce a counter-example may be due to lack of imagination or ingenuity rather than to the absence of a counter-example.

I have advanced the proposed definition as a definition of formal deductive validity, rather than of deductive validity in general, in order to allow for arguments which are deductively valid in virtue not only of their form but also of meaning relations among their atomic content expressions. The argument, "Today is Monday, because yesterday was Sunday," for example, is deductively valid in the sense that the

meanings of the premiss and the conclusion make it impossible for the premiss to be true and the conclusion false, but its validity rests partly on the meaning relations between “today” and “yesterday” on the one hand and between “Monday” and “Sunday” on the other hand. Such arguments can always be made formally deductively valid by adding premisses which are true by definition; in the example, we might add the premisses that yesterday is the day before today, Sunday is the day before Monday, and the days before identical days are identical days. Since the converse proposition is also true (any argument is deductively valid which can be made formally deductively valid by adding definitionally true premisses), we can define a **deductively valid argument** as an argument which is either formally deductively valid or can be made so by the addition of one or more definitionally true premisses.

### Distinguishing Enthymemes from *Non-Sequiturs*

Having separated off non-deductive arguments and deductively valid arguments, how are we to distinguish within the rest between enthymemes and mere *non-sequiturs*?

A tempting approach is to regard the enthymemes as the arguments among this set whose authors have omitted one or more premisses. That is, the question would be whether the arguer had an additional premiss in mind, but left it unstated, for example because she took it to be common knowledge (see again Aristotle’s *Rhetoric* I 2 1357s17-19) or because she wished to protect it from unwelcome criticism. We should reject this approach, for two reasons. First, we are often not in a position to question the arguer about whether she had another premiss in mind, and so must fall back on textual rather than psychological criteria, which will need to be supplied. Second, and more importantly, authors of acknowledged enthymemes

often have no additional premiss in mind. To take an everyday autobiographical example, I recently reasoned that it would not be difficult to find a house in a nearby city for which I had been given directions, because the house was just off the main road. This simple piece of reasoning is obviously an enthymematic argument, but I was not conscious of having omitted a premiss in articulating it—especially since I articulated it to myself before later verbalizing it to someone else. I invite the reader to try the same exercise with her or his own recently formulated enthymematic argument; I doubt that you will be conscious of having omitted a premiss. This fact, which supports the view that enthymemes do not have missing premisses, obviously makes it impossible to identify enthymemes as arguments whose authors omitted a premiss.

A second tempting strategy is to limit enthymemes to arguments which can be made deductively valid by adding a premiss. This “limitation”, however, is no limitation at all, for any argument can be made deductively valid by adding as a premiss the statement that, if the premisses are true, the conclusion is true. Let us call this statement the argument’s **associated conditional**. It is the conditional statement whose antecedent is the conjunction of the argument’s explicit premisses and whose consequent is the argument’s conclusion. This conditional statement can be regarded, in fact, as making explicit at least part of the claim which the arguer implicitly makes in inferring the conclusion from the premiss(es). To infer a conclusion from given premiss(es) is to assume that the conclusion follows from the premiss(es), and the conditional statement articulates this assumption.

An unwelcome consequence of the strategy of regarding an argument as an enthymeme if it can be made deductively valid by adding a premiss is that arguments whose premisses have no connection to their conclusion turn out to be enthymemes. “Two plus two equals four, so Ulan Bator is the capital

of Outer Mongolia," for example, would be an enthymeme, since it can be made deductively valid by adding the premiss, "If two plus two equals four, then Ulan Bator is the Capital of Outer Mongolia." On a truth-functional interpretation of the conditional, of course, this added statement is true, and so the expanded argument turns out to be formally valid and have true premisses. But the only way of showing that the assumption is true is to show that its consequent (i.e. the conclusion of the original argument) is true, so that the expanded argument is question-begging. So the argument is not a good one. Rather than going through such an involved discussion, we might prefer simply to say that the conclusion does not follow, that the argument is a mere *non sequitur*. But how are we to distinguish such *non-sequiturs* from enthymemes?

Our example indicates that an argument is a *non-sequitur* if its associated conditional can only be shown to be true by showing that the conclusion is true. This condition obtains when the argument's premisses are irrelevant to its conclusion. An obvious form of such irrelevance is the absence of any connection in meaning between the premisses and the conclusion. Such a meaning connection is absent when there is no content expression common to a premiss and the conclusion, even implicitly. The presence of a common content expression, or the ability to produce a common content expression by making definitionally equivalent substitutions, would make the premiss(es) relevant to the conclusion in this sense. Let us call this sense of relevance **topical relevance** of the premiss(es) to the conclusion.

We might also be tempted to regard an argument as a *non-sequitur* when its premiss is irrelevant to its conclusion in a more substantive sense. That is, there is a common content expression, but the [premisses] don't seem to provide any support for the conclusion. Suppose someone argues that Samantha is trustworthy because she has red hair. What does having red hair have to

do with being trustworthy, we might respond. The premiss is irrelevant, and the conclusion just does not follow. Although this reaction is natural and ultimately defensible, I prefer to count such arguments as enthymemes and to rest the judgment of their inadequacy on a substantive verdict about the falsehood of the implicit assumption in virtue of which their conclusion follows from their premiss(es). My reason for doing so is that irrelevance is a slippery concept, easy to misuse as a term of apparent logical criticism, and I would prefer to confine its application to cases where the criteria are clear and genuinely logical. We should beware of theories of argument which disguise substantive objections to claims and arguments in terminology which sounds purely logical.

We also want to count as *non-sequiturs* formal fallacies, such as affirming the consequent and denying the antecedent. The problem with such arguments is that their premisses are **too** topically relevant to their conclusions. That is, every content expression occurs at least twice. To explain why excessive topical relevance is a problem, I need to anticipate the results of the second section of this paper. There I shall argue that an enthymeme implicitly assumes a universal generalization of its associated conditional over its repeated content expressions, in fact the maximal generalization consistent with plausibility. Since a formal fallacy is by definition invalid and contains no unrepeated content expressions, the maximal generalization of its associated conditional will be a purely formal principle which is a logical falsehood. Suppose, for example, that someone argues that Charles works with graphite on the ground that he has black stains on his hands which people who work with graphite have. The maximal universal generalization of this argument's associated conditional is that any entity has a property if that entity has another property and any entity with the first property has the second property. (For any  $x$ ,  $F$  and  $G$ ,  $x$  is  $F$  if  $x$  is  $G$  and whatever

has F has G.) Less maximal generalizations, admittedly, might have some plausibility. It might be that any individual works with graphite if that individual has black stains on his hands and everyone who works with graphite has black stains on his hands. I confess that I do not know how to respond to this problem. If pressed, I would allow formal fallacies as enthymemes and evaluate them on the basis of the implicit assumption in virtue of which the conclusion follows from their premisses.

One way of rejecting some formal fallacies as *non-sequiturs* is to point out that their associated conditional, if added as a premiss, would make an existing premiss redundant. Thus the conclusion cannot be made to follow deductively from the whole set of original premisses. I once thought this fact made such arguments *non-sequiturs*, but have abandoned this view, for three reasons. First, since deductively valid arguments with redundant premisses are still deductively valid, why shouldn't enthymemes with redundant premisses still be enthymemes? Second, the alleged redundancy of an existing premiss depends on the controversial truth-functional interpretation of the conditional. Third, this criterion does not rule out all formal fallacies as *non-sequiturs*. For example, if we add as a premiss the conditional associated with the argument in the preceding paragraph that Charles works with graphite, none of the original premisses becomes redundant.

I conclude that enthymemes differ from *non-sequiturs* in that their premisses are partially topically relevant to their conclusions. That is, at least one content expression occurs, perhaps implicitly, in both the premisses and the conclusion. And at least one content expression occurs only once.

The reader will be able to think of apparent enthymemes which do not appear to meet this criterion of partial topical relevance. Suppose someone says, "It is cold, so I should put on my coat." (I owe the counter-example

to Robert Ennis.) We would count this argument as an enthymeme, but there is no common content expression, even if we substitute definitionally equivalent sentences for the premiss and conclusion. There is, however, a temporal adverb "now" implicit in the present tense of both verbs. This adverb can be regarded as the repeated content expression, and thus the argument is an enthymeme after all.

An awkward consequence of this extension of the criterion of partial topical relevance is that some arguments which were excluded as *non-sequiturs* come back in to the class of enthymemes. We can still keep out the argument from a truth of arithmetic to a truth of geography, since truths of arithmetic do not come with an implicit temporal adverb. But an argument, for example, that Washington is the capital of the United States because Ulan Bator is the capital of Outer Mongolia will have to count as an enthymeme. The inadequacy of such an argument will have to rest on the inadequacy of the implicit assumption in virtue of which its conclusion follows from its premiss.

### The Universal Generalization Thesis

The standard approach to evaluating the inference in an enthymematic argument is to identify and evaluate the implicit assumption in virtue of which the conclusion follows from the premiss(es); if it is true, the enthymematic inference is valid, but if false, invalid. A variant allows an enthymematic inference to be invalid where the implicit assumption is true but insufficient to make the original argument deductively valid if it is added as a premiss. The standard approach typically regards the implicit assumption as an unexpressed, missing, unstated, tacit or even suppressed premiss of the enthymematic argument; for examples of each term, see respectively van Eemeren and Grootendorst (1984), Govier (1985), Scriven (1976), Hitch-

cock (1983) and Thomas (1981). I shall argue later that the implicit assumption is better regarded as a non-formal rule of inference, but nothing in what immediately follows depends on this position.

Since our purpose is evaluation, we should look for an assumption on which the argument depends, regardless of whether the arguer had such an assumption in mind, rather than an assumption the author had in mind, which may be neither necessary nor sufficient for the conclusion's following from the premiss(es). Robert Ennis (1982) used the terms "needed assumption" and "used assumption" for these two types. I propose instead to use the terms "argument's assumption" and "arguer's assumption", for two reasons. First, as Ennis holds and I am about to argue, an enthymematic argument assumes more than is strictly needed to make the conclusion follow from the premiss(es). Second, an arguer uses the argument's assumption in drawing a conclusion, even if she is not aware of having done so. So in what follows we are looking for a general characterization of the assumption of an enthymematic argument which is implicit in inferring its conclusion from its premiss(es). I call the assumption "implicit" rather than "unstated" because "unstated" suggests something the arguer had in mind.

An enthymematic argument, we have seen, assumes at least the truth of the argument's associated conditional. But, I suggest, it assumes more. Consider the argument, "Depo-Provera is safe, because it is an effective contraceptive." At the time of writing, this argument's premiss was accepted as true, but its conclusion was controversial. Suppose, however, that the conclusion is true. On a truth-functional interpretation of the conditional, the associated conditional "If Depo-Provera is an effective contraceptive, then Depo-Provera is safe" is true. Other interpretations of the conditional either make the associated conditional true or require us to determine whether the consequent follows from the ante-

cedent, which is the question we are trying to answer. So, if we take the argument to be assuming only the truth of the associated conditional, we are driven to say either that the conclusion follows or that we are in the dark as to whether it does. But in fact we know that it does not follow, that the argument is a bad one. The mere fact that something is an effective contraceptive, we might say, does not show that it is safe. We might even be able to cite an example of another drug which is an effective contraceptive but is not safe, say the Dalkon Shield. These responses are irrelevant if an enthymeme assumes only its associated conditional. They are relevant, and conclusive, if an enthymeme assumes a universal generalization of its associated conditional with respect to at least one repeated content expression. Let us call the thesis that an enthymematic argument implicitly assumes the truth of a universal generalization of its associated conditional with respect to at least one repeated content expression **the universal generalization thesis**.

The thesis just mentioned is equivalent to supposing that one can object to an enthymematic argument by producing a parallel argument with true premiss(es) and a false conclusion, obtained from the original by uniform substitution on one or more repeated content expressions. If we think it legitimate to respond, "You might as well say that the Dalkon Shield is safe because it is an effective contraceptive", where it is known that the Dalkon Shield is an effective contraceptive but not safe, then we accept the universal generalization thesis, at least for this argument.

The above remarks do not prove the universal generalization thesis. They do, however, make it plausible. My strategy in what follows will be to make it more plausible by showing that the implicit assumption produced by the application of the thesis conforms tolerably well to our intuitive judgments, as well as to the theory of enthymemes in traditional logic, and that there are good explanations for

its divergence from our intuitions.

### **Confirmation of the Universal Generalization Thesis**

Consider first an argument of a common type, in which premiss and conclusion have the same grammatical subject but different grammatical predicates. The logician's favourite example is the sentence, "Socrates is a man, so Socrates is mortal." The universal generalization of this argument's associated conditional is the sentence, "For any  $x$ , if  $x$  is a man,  $x$  is mortal," or in standard English, "Every man is mortal." According to the universal generalization thesis, this is the only possible implicit assumption of the argument, since "Socrates" is the only content expression which occurs more than once in the associated conditional. Thus, we can conclude that someone who advances the argument, "Socrates is a man, so Socrates is mortal," is committed to the proposition that every man is mortal. And this is what we intuitively think.

There are arguments where we intuitively think that the implicit assumption is a particular statement. For example, we would suppose that someone who argues, "Depo-Provera is safe because any drug is safe which has been approved at all levels of the drug testing procedure in the United States", is implicitly assuming that Depo-Provera has been approved at all levels of the drug testing procedure in the United States. Since the universal generalization thesis holds that the implicit assumption is always a universal generalization, our intuitive judgments about these arguments might seem to conflict with the thesis. But, surprisingly, in cases of this kind the universal generalization in question is equivalent to a particular statement. In abbreviated form, the associated conditional of the above argument is the sentence, "If any consistently approved drug is safe, then Depo-Provera is safe." Its universal general-

ization is the sentence, "For any  $F$ , if any consistently approved drug is  $F$ , then Depo-Provera is  $F$ ," or, in somewhat more standard English, "Depo-Provera has every property which every consistently approved drug has." But this sentence is equivalent to the sentence, "Depo-Provera is a consistently approved drug." We can demonstrate this equivalence by deducing each sentence from the other. One property which every consistently approved drug has is that it is a consistently approved drug. So, if Depo-Provera has every property which every consistently approved drug has, then it is a consistently approved drug. But, conversely, if it is a consistently approved drug, then it will have every property that every consistently approved drug has, since it is one of the consistently approved drugs.

Consider next an enthymeme of the kind recognized by traditional logic, that is, an argument which can be filled out so as to become a two-premiss syllogism in one of the moods recognized as valid by the Aristotelian tradition. Consider the argument, "No man has feathers, so no man is a bird." Since just one content expression, "man", appears in the associated conditional, "If no man has feathers, then no man is a bird," the universal generalization thesis implies that the implicit assumption of this argument is the sentence, "For any  $F$ , if no  $F$  has feathers, then no  $F$  is a bird," that is, "Any non-feathered thing is not a bird," or, contraposing, "Every bird has feathers." This is exactly the assumption which "traditional logic" would supply on the basis of its recognition of the argument as an incomplete second-figure assertoric syllogism. As can be verified by complete enumeration, this coincidence of results obtains for all incomplete assertoric syllogisms.

We find the same coincidence of results for arguments which we would intuitively recognize as incomplete instances of arguments deductively valid in virtue of the sentence-forming expressions "not," "and," "or" and



“if”. Consider, for example, the argument. “John is asleep, because he’s asleep when the television is off.” We would intuitively recognize an incomplete *modus ponens* argument of the form, “If  $p$  then  $q$ , and  $p$ , so  $q$ .” The implicit assumption is intuitively that the television is off. The argument’s associated conditional is the sentence, “John is asleep, provided that, if the television is off, he’s asleep.” Here the universal generalization thesis allows us to generalize on the words “John” or “asleep,” but, as I shall argue later, we are entitled to generalize on the molecular content expression, “John is asleep.” The resulting sentence is, “For any  $p$ ,  $p$ , provided that, if the television set is off,  $p$ ,” or, in slightly more standard English, “Any proposition at all is true if this proposition follows from the proposition that the television set is off.” But this sentence is equivalent to the proposition that the television set is off. (The equivalence can be demonstrated by assuming each sentence in turn and proving the other on its basis. To prove the particular statement, instantiate the generalization with the sentence “The television set is off” and detach the logically true antecedent, “If the television set is off, the television set is off.” To prove the universally generalized conditional, assume its antecedent for an arbitrary sentence  $q$  and use the particular statement to detach the antecedent of this antecedent, thus deriving the consequent of the larger conditional; then conditionalize and generalize over  $q$ .)

Similar coincidences of results between our intuitive judgments and the application of the universal generalization thesis apply to other incomplete examples of forms of argument which are deductively valid in virtue of the meanings of “not,” “and,” “or” and “if.”

For some arguments, however, the universal generalization thesis gives a result different from our intuitions. As far as I have been able to determine, the intuitively supplied assumption is either a stronger assumption from

which we can deduce the universal generalization of the associated conditional or a weaker assumption which can be deduced from the universal generalization of the associated conditional.

An example of the first type of discrepancy, supplied by Mary Richardson, occurs with the enthymematic argument, “ $x$  and  $y$  have started wars, so some generals have started wars.” We would intuitively suppose that this argument assumes that  $x$  and  $y$  are generals. The universal generalization of the associated conditional—that some generals have every property which  $x$  and  $y$  have—is a weaker statement which follows from the intuitively supplied assumption that  $x$  and  $y$  are generals. For, if  $x$  and  $y$  are generals, then some generals—namely  $x$  and  $y$ —have every property which  $x$  and  $y$  have. The intuitively supplied assumption here supplies the most obvious backing for the mechanically derived assumption. Curiously our earliest explicitly labelled enthymeme—Aristotle’s example of the argument, “Doreius has won a crowned contest, for he has won in the Olympic games”—is of this type. (It is also not an incomplete categorical syllogism, unless one recasts the argument very awkwardly.) The universal generalization of the associated conditional is that anyone who has won in the Olympic games has won a crowned contest, a claim compatible with the crowned contest in question being different from the Olympic games. The intuitively supplied assumption, which Aristotle regards as unexpressed because everybody knows it, is that the Olympics is a crowned contest. This claim is stronger than the universal generalization, and again supplies the most obvious backing for it. In these cases, then, the universal generalization thesis conforms to our intuitions to the extent that the assumption it supplies is at least part of what our intuitions tell us the argument assumes. Without background knowledge, it can be argued, our intuitions could play us false in such cases.

An example of the second type of discrepancy, in which the intuitively supplied assumption is weaker than the associated conditional's universal generalization, arises with the argument, "All socialists support trade unions, so you are a socialist." (This example too comes from Mary Richardson.) We would intuitively supply as the implicit assumption the claim that you support trade unions. And we would then go on to criticize the resulting argument as invalid, since it is an example of affirming the consequent which is not valid on other grounds. The universal generalization thesis, however, tells us that the argument assumes that, for any property *F*, if everyone who has *F* supports trade unions, then you have *F*. In somewhat more standard English: You have every property whose possessors all support trade unions. Taking the property of supporting trade unions as one such property, we can derive by instantiation the intuitively supplied assumption that you support trade unions. Since we cannot make a converse derivation, the assumption postulated by the universal generalization thesis is stronger than the intuitively supplied assumption. Is the universal generalization thesis therefore too strong? I think not. The intuitively supplied assumption is a reasonable conjecture about the arguer's assumption, what the arguer thought licensed his inference of the conclusion from the premiss. But this reasonable conjecture is an assumption which is insufficient to make the conclusion follow, and which therefore cannot serve as the argument's assumption, the principle in virtue of which the conclusion follows from the premiss, to which the arguer implicitly commits himself in drawing the conclusion. Since our purpose is to evaluate the inference in an enthymematic argument, we should supply an assumption which is sufficient to make the conclusion follow, and investigate the truth of that assumption. The universal generalization thesis gives us such an assumption, whereas our pre-theoretic-

al intuitions do not.

### **Qualifications of the Universal Generalization Thesis**

In discussing the enthymematic argument that John is asleep, because he is asleep when the television set is off, I mentioned that, where an argument contains repeated molecular content expressions, the universal generalization thesis is indeterminate as to whether one should generalize over the molecular repeated content expressions, over atomic repeated content expressions separately, or only over some of them, and if so which ones. Here the intuitively correct resolution of the indeterminacy seems to occur if one generalizes over content expressions which are as molecular as is plausible. In other words, if a molecular content expression is repeated, one generalizes over the entire expression rather than over one of its constituent content expressions, or over each constituent content expression separately—unless it would be implausible to do so.

The universal generalization thesis is indeterminate in a second respect. If the associated conditional contains more than one repeated content expression, where these are not part of a single molecular content expression, the thesis does not tell us which of these expressions we are to generalize over; an argument which reveals this indeterminacy is the argument, "Marijuana should be legalized, because it is no more dangerous than alcohol, which is already legal," where we are not sure whether to generalize over all or only some of the repeated content expressions "marijuana," "alcohol" and "legal." The intuitively correct resolution of this indeterminacy is to generalize over each of the repeated content expressions—unless it would be implausible to do so. For example, the argument for legalizing marijuana assumes that any substance which is no more dangerous than an already legal substance should be legal-

ized. If we generalize only with respect to "marijuana," we get the implicit assumption, "If alcohol is already legal, anything which is no more dangerous than alcohol should be legalized." If the argument depended only on this assumption, then it would be irrelevant to object that by the same reasoning one would have argued in the nineteenth century that heroin should be legalized, since it is no more dangerous than opium, which is already legal. But this objection seems relevant. So it seems justifiable to generalize the associated conditional with respect to both "marijuana" and "alcohol," producing the result that conforms to our intuitive judgment. Note that it is not so plausible to generalize with respect to the content expression "legal." If we did so, we would attribute to the argument the assumption that any substance which is no more dangerous than another substance should be given all the properties which the other substance has. Such an assumption is absurd, because, for example, it is impossible to give marijuana the chemical properties of alcohol.

Apart from these confirmations by our intuitive judgment, the justification for broad and multiple generalization is that arguments are implicitly general, so that any repeated content expression is a candidate for generalization. The justification for making exceptions on grounds of implausibility is the principle of charity: in case of ambiguity, interpret a passage in the way in which it makes the best possible case.

The last example exhibits a third and final indeterminacy in the universal generalization thesis. Over what class or category should we generalize the repeated content expression(s)? For some arguments, the class or category is a matter of indifference, since it drops out in the simplification of the generalized conditional. For other arguments, the class or category makes a difference. I generalized "alcohol" and "marijuana" over the class of substances. If one generalized over

kinds of entities, or over any item whatever, one could easily find objections to the implicit assumption thus generated. For example, driving a car without a seat belt is no more dangerous than hang-gliding, which is legal, but not everyone accepts the proposition that driving a car without a seat belt should be legalized. But such an objection seems unfair. The argument involves a comparison of the danger of two substances, in particular, of two mood-altering drugs, and it seems unreasonable to extend the principle on which the argument is relying beyond this subcategory.

In some cases the context will impose restrictions on the class over which to generalize. Robert Ennis (1969) gives an example of a teacher asking a group of elementary school pupils to say whether words ending in "-ing" are participles or gerunds in given sentences. Asked to justify his claim that a given word is a gerund, a pupil replies, "Because it is the subject of a sentence." This is a good justification, but the generalization, "Every subject of a sentence is a gerund," is false. The context of utterance of the pupil's argument indicates that we should generalize the associated conditional only over the class of words ending in "-ing". Doing so, we get the sentence, "For any word ending in '-ing', if it is the subject of a sentence, it is a gerund," or, in more standard English, "Every word ending in '-ing' which is the subject of a sentence is a gerund."

In short, the appropriate qualification of the universal generalization thesis seems to be that each generalized content expression should be generalized over the entire category to which it belongs, unless the context or considerations of plausibility indicate a restriction on this category.

We are now in a position to articulate the fully qualified version of the universal generalization thesis:

The author of an enthymematic argument implicitly assumes the truth of a universal generalization of

the argument's associated conditional with respect to one or more content expressions which occur more than once. Unless it would be implausible, where a molecular content expression is repeated, this generalization is over the most molecular repeated content expression. If more than one distinct content expression is repeated, this generalization is over all such distinct content expressions except those over which it would be implausible to generalize. Unless the context of utterance of the argument or considerations of plausibility indicate a restriction, the generalization is over the entire category of items within which the content expression's significatum occurs.

### Missing Premisses or Rules?

I now turn to the question hinted at earlier of whether we should regard the implicit assumption in virtue of which an enthymeme's conclusion follows from its explicit premiss(es) as a missing premiss of the enthymeme. Although this interpretation of the implicit assumption, is the usual one, it is problematic.

First, we ordinarily define an argument as a set of statements, one of which, the conclusion, is advanced on the basis of the other(s), the premiss(es). To say that an argument has a given premiss is to say that that statement is a member of the set. But by definition a missing premiss is not a member of the set; it is not a statement, because it is not stated. So, in saying that an argument has a missing (or unexpressed, or tacit, or unstated, or suppressed) premiss, we seem to be saying that an argument has a premiss which it does not have.

One can avoid the self-contradiction just expressed by redefining the concept of argument to include among the premisses sentences which the arguer had in mind but left unstated. A second problem, however, arises. To regard an enthymeme's implicit assumption

as a missing premiss is to regard the argument as somehow defective or incomplete. But most deductive arguments, I would guess, are enthymematic, and even the most logically acute among us are prone to utter enthymematic arguments. We should therefore be suspicious about a theory which regard enthymematic arguments as incomplete.

A common response to this problem is to explain the frequency of such allegedly logically defective arguments by their superior rhetorical effectiveness. We have the authority of Aristotle, in the aforementioned passage from the *Rhetoric*, for the view that orators, in order to make their arguments brief enough for audiences to follow, will omit premisses which the hearer can supply because everybody knows them. The trouble with this explanation, and in my view the most serious objection to regarding an enthymeme's implicit assumption as a missing premiss, is that we are unaware of having omitted a premiss when we advance an enthymeme, especially when we do so to convince ourselves. We should, I conclude, be skeptical of the claim that enthymemes are logically incomplete, with a missing premiss.

The standard alternative to the missing premiss approach is to take the implicit assumption of an enthymematic argument as the articulation of a rule of inference in virtue of which the conclusion follows from the premiss(es). This rule approach can be found in Toulmin (1958), who seems to have got it from Gilbert Ryle (1954). It is also adopted by Rolf George (1972, 1983), who gets it from the nineteenth century logician Bernard Bolzano (1837). The rule in question will be a non-formal rule of inference, in the sense that the statement of the rule will include at least one content expression. If this rule is implicit, nothing is missing from the enthymeme which ought from a logical point of view to be stated, just as there is no omission if a formal rule of inference like *modus ponens* is not stated when a

conclusion is drawn in accordance with it.

Regarding the implicit assumption as a rule makes it possible to evaluate an enthymematic inference without stating the implicit assumption. The procedure is a modification of the procedure of counter-examplifying described above as a method of testing for formal deductive validity. Just as a substitution on the atomic content expressions of an argument which produces an argument with true premisses and a false conclusion will show that the formal rule of inference in accordance with which the original argument's conclusion follows from its premiss(es) is invalid, so a substitution on the repeated content expressions which produces an argument with true premisses and a false conclusion will show that the non-formal rule of inference in accordance with which the original argument's conclusion follows from its premiss(es) is invalid. In the first case we say that the argument is not formally deductively valid. Let us say in the second case that the argument is not **enthymematically valid**. This concept of enthymematic validity is due to Rolf George (1972, 1983), following Bolzano (1837). To define this concept, we need the concept of an enthymeme's **variable content expressions**, the repeated content expressions over which one generalizes in articulating its implicit assumption; the criteria for their identification appear in the qualified version of the universal generalization thesis. We also need the concept of a **permissible substitution**, the substitution for a variable content expression of a content expression which belongs to the class or category over which that variable content expression is generalized in articulating an enthymeme's implicit assumption; the criteria for delimiting this class or category also appear in the qualified version of the universal generalization thesis. With these concepts, we can define an argument as **enthymematically valid** if and only if no uniform permissible substitution on its variable content expressions produces an argument with

true premisses and a false conclusion.

To show that an enthymeme is (enthymematically) invalid, therefore, we simply need to construct an appropriately parallel argument with true premisses and a false conclusion. I have already given some examples of this procedure. Thus, the desirability of legalizing marijuana does not follow from the fact that marijuana is no more dangerous than alcohol, which is already legal: opium was legal in the nineteenth century and is no more dangerous than heroin, but it was not desirable at that time to legalize heroin. And to the argument for the safety of Depo-Provera, one can reply that you might as well say that the Dalkon Shield is safe because it is an effective contraceptive.

As with formal deductive validity, inability to construct such a counter-example does not prove enthymematic validity, since the inability might be due simply to a failure of imagination. To prove enthymematic validity, one needs to make the implicit assumption explicit and if necessary to support it with argument. The premisses of such supporting arguments are what Toulmin (1958) calls backing and Ennis (1982) backups, in this case for an implicit assumption rather than an explicit premiss. They are what Scriven (1976) refers to by the expression "optimal assumptions": the best basic support one can find for the drawing of the stated conclusion from the stated premisses.

### Other Purposes for Identifying Enthymeme's Assumptions

So far I have been discussing the task of identifying an enthymeme's implicit assumption for the purpose of evaluating the enthymeme's inference. A survey of recent philosophical literature shows that philosophers at least sometimes have more specific and pointed reasons for identifying such implicit assumptions. It is instructive to consider the variety of such purposes and the way they modify the criteria for

identifying the assumption.

Barnes (1975), for example, routinely fills in Aristotle's arguments, relying on the entire Aristotelian corpus, to try to **understand** why Aristotle thought his conclusions followed from his premisses. For this purpose, which is that of identifying the arguer's assumption rather than the argument's assumption, evidence of the arguer's beliefs will help to resolve ambiguities about the argument's implicit assumption, and may furnish backing for the assumption one can reconstruct using just the argument itself. Reconstruction of the arguer's assumptions will be guided, on the basis of the principle of charity, by a presumption that they do genuinely license the inference involved—that is, that the argument will become deductively valid if the arguer's assumptions are added as extra premisses.

Philosophers such as Bertrand Russell (1948), David Palmer (1972), David Bryant (1972), Norman Geisler (1973, 1978) and Stefan Nowak (1978) supply an additional premiss to **strengthen** an apparently flawed argument by showing that the addition of a plausible premiss makes it a good argument. For this purpose, a premiss somewhat stronger than the assumption implicit in the argument itself may be appropriate.

Geisler (1978) and R. A. Fumerton (1980) supply an extra premiss in order to **seek support** for their own position by showing that the author of an argument implicitly supports that position. For this purpose, one needs to be as charitable as possible to the author of the argument, since one needs to claim that any defensible filling out of the argument commits its author to one's own position.

Lewis Ford (1975) supplies additional premisses to **discredit** an argument by showing that any added premisses sufficient to make it deductively valid are false. This purpose also requires as charitable as possible a filling out of the argument's premisses.

## Note

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