

The concept of argument

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ABSTRACT: This paper is a theoretical conceptualization of the concept of argument, extracted from a chapter on informal logic in a volume on the philosophy of logic in a forthcoming multi-volume handbook on the philosophy of science. It implicitly addresses requirements for an Argument Interchange Format, especially in its proposal that an argument can be a premiss of an argument.

According to the paper, an argument is a set of one or more interlinked premiss-illative-conclusion sequences. Premisses are assertives, not necessarily asserted by anyone. Conclusions can be speech acts of any type. Either can be expressed either in language or by visual images or physically. Two arguments can be linked either by having a conclusion of one as a premiss of the other or by having one as a premiss of the other. A box-arrow system for diagramming arguments thus conceived is illustrated with reference to three expressed arguments; the diagrams show that the diagramming system can handle conditional proof, argument about an arbitrary instance as a proof of a universal generalization, argument by cases, and *reductio ad absurdum*.

KEYWORDS: argument, premiss, conclusion, illative, subordinate argument, superordinate argument, complex argument, box-arrow diagrams, argument diagramming, premiss indicator, conclusion indicator, suppositional arguments, inference

What is an argument?

In western philosophy, an argument is traditionally defined as “a system composed of premisses and a conclusion” (Diogenes Laertius 7.45, citing a Stoic definition). The plural of “premisses” is a Stoic idiosyncrasy: few other philosophers have accepted the Stoic denial (Sextus Empiricus 2.443) that there are one-premissed arguments. But, even with an amendment to allow for one-premissed arguments, the definition is not very satisfactory, for two reasons: it requires a further explanation of what a premiss is and what a conclusion is, and it forecloses by stipulation alternative conceptions of the components of an argument. It is therefore useful to develop a more informative and less question-begging conception, starting from everyday usage of the word “argument” and sharpening that usage so as to circumscribe a class of entities that is an appropriate subject for theoretical reflection.

In English, the word “argument” and the corresponding verb “argue” are used in two quite clearly distinguishable senses.

One sense is that in which we say such things as “John Searle argued that no computational system can have a semantics” or “the *Summa Theologica* of Thomas Aquinas contains five arguments for the existence of God”. In this sense, arguing requires only one arguer. The arguer expresses a point of view on a question, and offers as support for this position one or more reasons. The expression of the point of view and the provision of one or more reasons in its support constitute a complex speech act, an illocutionary act of arguing. The arguer addresses this complex speech act to one or more readers, listeners or observers, who need not reply. Arguing in this sense is typically

emotionally neutral, and typically not accompanied by hostility.

The other sense is that in which we say such things as “they were arguing with one another” or “they had a bitter argument” or “she argued with him”. In this sense, arguing requires at least two arguers. They express to each other divergent opinions on some question. Each attempts to get the other(s) to accept their point of view, not necessarily by offering reasons in support of it. Emotional intensity and even hostility often accompany such disputes.

For ease of reference, I shall call these the reason-giving and the disputational senses of “argument” and “argue”. Informal logic studies arguments in the reason-giving sense. It is worth noting that English is apparently unique in using the same word for these two senses. In classical Greek, for example, the reason-giving sense is expressed by the word *logos* (e.g. in Plato’s *Phaedo*, at 90b-91c) in one of its many senses, whereas the disputational sense is expressed by the word *amphisbêtêsis* or *antilogia*, “dispute” or “controversy”. In Latin, the reason-giving sense is expressed by the word *argumentum*, “proof” or “evidence”, the disputational sense by the word *disputatio*, “debate” or “dispute”. In French, as Plantin (2003: 174) points out in detail, the reason-giving sense is expressed by the verb *argumenter* (“to argue [that]”) and its cognates, the disputational sense by the verb *discuter* (“to discuss”, in an aggressive way). In Spanish (Claudio Duran, personal communication), the reason-giving sense is expressed by the word *argument*, and the disputational sense by the words *discusión* (discussion) or *controversia* (controversy) or *disputa* (dispute). In Russian, the reason-giving sense is expressed by the word *dovod* (supporting reason), the disputational sense by the word *spor* or *ssora*. In German, the reason-giving sense is expressed by the word *Argument*, the disputational sense by the word *Disput*. The reader is invited to check how other languages handle the distinction.

Reason-giving and disputation can of course coincide in a particular case. But not all reason-giving occurs in disputes; in fact, most of it occurs outside the context of disputes, or at least outside explicit ones. And not all disputes involve reason-giving; typically they do, but typically as well they involve other components that are intrinsic to the dispute. If reason-giving and disputing were shown in an Euler diagram, the circles would overlap.

An argument in the sense studied by informal logic can thus be conceived initially as a type of discourse in which the author expresses a point of view and offers one or more reasons in support of that point of view. We can make this conception more precise by considering in the first place what it is to offer a supporting reason for a point of view, and how one can do so. A typical means of doing so is to utter a sentence of a language, or something equivalent to a sentence. Searle (1979) has proposed a taxonomy of the illocutionary acts that people perform in uttering sentences, a classification based on differences in the point of the act. *Assertives* have as their point to commit their utterers to the truth of an expressed proposition *p*; they include not only stating that *p* but also hypothesizing, suggesting, boasting, and deducing that *p* (Searle 179: 13). *Directives* have as their point to get the addressee to do something; they include requesting, advising and asking (13-14). *Commissives* have as their point to commit the utterer to do something; they include promising and contracting (8, 14). *Expressives* have as their point to express a psychological attitude of the utterer to the state of affairs specified by the proposition expressed; they include apologizing, congratulating and thanking (15-16). *Declaratives* have as their point to make something the case by the very utterance of the sentence; they including declaring war, christening, delivering judicial verdicts and stipulating how one is going to use a certain expression (16-20).

As Van Eemeren and Grootendorst point out (1984: 43), only an assertive can count as the offering of a supporting reason for a point of view. We can test this claim by considering examples of other sorts of illocutionary acts followed by “so” followed by an arbitrary sentence. If we consider a directive followed by “so” followed by a directive, such as:

* *What time is it? So you must go home.*

we find it difficult to make sense of such discourse, except by supposing that the speaker assumes that a correct answer to the question implies that it is past time for the addressee to go home. It is easier to make sense of a commissive followed by “so” followed by an assertive, such as:

? *I promise to pick up some milk on the way home. So you don't need to get it.*

But we can only make sense of such discourse because to make a commitment to do something in the future is implicitly to predict that one will do it. The argument would be more straightforward if one made the prediction explicitly by means of an assertive:

I will pick up some milk on the way home. So you don't need to get it.

We strain to make sense of an expressive followed by “so” followed by an assertive, such as:

* *Congratulations on your anniversary. So you are married.*

The act of congratulating a couple on their anniversary implies that they are married, but congratulating them is an awkward way of supporting the claim that they are married. It would be much more straightforward to say something like:

I congratulated them on their anniversary. So they are married.

Similar problems arise in making sense of a declarative followed by “so” followed by a directive:

* *I hereby sentence you to two years less a day in prison. So the guards will now take you to prison.*

As with directives, we need to suppose an intermediate step in which the speaker expresses a commitment to the existence of the state of affairs brought about by the declarative:

You have just been sentenced to two years less a day in prison. So the guards will now take you to prison.

Thus to offer a supporting reason by uttering a sentence, or something equivalent to a sentence, is to perform some sort of assertive, i.e. to commit the utterer to the truth of the expressed proposition. The word “truth” needs to be understood broadly as applying to normative and evaluative propositions as well as descriptive ones, for the following discourses make sense as arguments:

One must not cause unnecessary harm. So it is wrong to give someone distressing news that the person does not want to hear.

All things considered, this car is the best model of the type we want that is in our price range. So let's buy it.

It is possible, however, to offer a supporting reason without uttering a sentence. Drawings, figures, photographs, paintings, gestures, body language and other non-linguistic communicative devices can serve as premisses of an argument. Groarke (1996) urges the recognition of visual arguments. Gilbert treats verbalized or verbalizable premiss-conclusion structures as one of four possible modes of argument, defined as “*any exchange of information centred on an avowed disagreement*” (Gilbert 1997, 104; italics in original). He calls this mode the “logical-critical” mode. Emotional arguments rely on the use and expression of emotion, and can be communicated without language (83). Visceral arguments rely on physical activity, such as touching or body language (84). “Kisceral” arguments rely on the intuitive or the imaginative (86). Although Gilbert uses the

disputational rather than the reason-giving sense of argument, he gives convincing examples of reason-giving that is not verbalized. What is common to these various types of reason-giving is that their authors express to one or more addressees a commitment to the truth of a proposition.

Having specified a necessary condition for offering a supporting reason—namely, expressing to one or more addressees a commitment to the truth of a proposition—and indicated a variety of ways in which one may satisfy this necessary condition, we can gain further precision on the reason-giving sense of argument by considering what sorts of points of view can function as conclusions supported by the reason or reasons offered. Again, we can use the “so” test, this time focusing on what comes after the word “so” rather than what comes before it. Clearly we can express the conclusion of an argument by means of an assertive:

The whale suckles its young. So it is a mammal.

But, as Pinto (2001a) points out, the arguer’s endorsement of a point of view may be a directive, such as a request for information (*you were there, so what was it like?*) or a recommendation to do something (*there is a forecast of thundershowers, so let’s cancel the picnic* or *I’m feeling cold, so please close the door*). It can also be a commissive (*I know how difficult it will be for you to get the milk, so I promise you that I will pick it up on the way home*), an expressive (*my conduct was inexcusable, so I apologize most sincerely*), or a declarative (*the evidence establishes beyond a reasonable doubt that you committed the crime of which you are accused, so I hereby find you guilty as charged*).

As with supporting reasons, conclusions can be expressed not only by uttering sentences of a language, or things equivalent to a sentence, but also by producing visual images, using “body language” including facial expressions, or performing physical actions like touching someone. Such non-verbalized conclusions are typically implicit in the communicative activity, and thus somewhat indeterminate.

What is crucial to an argument is the claim that the reasons collectively support the conclusion. The addressee of an argument is invited to accept the conclusion on the basis of the reasons offered. In Pinto’s happy phrase, “Arguments are invitations to inference” (Pinto 2001b: 37), where “inference” means “the mental act or event in which a person draws a conclusion from premisses, or arrives at a conclusion on the basis of a body of evidence” (32). In inferring, a person adopts or reinforces an attitude towards the proposition embedded in the conclusion. These attitudes include a range of doxastic attitudes, from being convinced of it through being inclined to believe in it and suspecting it to considering it possible and having no idea about it (Pinto 2001a:12). They also include such non-doxastic attitudes to propositions as fearing, desiring, intending and hoping (2001a:16).

The condition that an argument is an invitation to an inference from the offered reasons to the conclusion applies even in suppositional reasoning and argument where the conclusion drawn shares the suppositional status of a premiss; the conclusion may in fact be an absurdity whose derivation will subsequently be used, in conjunction with an acknowledgement of its absurdity, to reject that premiss. It also applies, obviously, to arguing purely dialectically, from the assumptions of an interlocutor that one does not oneself share.

The claim that the offered reasons support the conclusion can be marked linguistically, by means of an illative expression governing the conclusion or a reason. Let us use the expression *premiss indicator* for an illative like “since” which (in its illative use) indicates that the immediately

following assertive is offered in direct support of the immediately preceding speech act, and the expression *conclusion indicator* for an illative like “therefore” which (in its illative use) indicates that the immediately preceding assertive is offered in direct support of the immediately following speech act. To introduce a reason by a premiss indicator is to perform a special type of assertive, which we might call premissing: to premiss a proposition is to put it forward as a (perhaps partial) basis for inferring a conclusion. Similarly, to introduce a conclusion by a conclusion indicator is to perform a special type of speech act (whether assertive, directive, commissive, expressive or declarative), which we might call concluding: to conclude a proposition is to put it forward for acceptance on the basis of one or more assertives offered as supporting reasons. Note that acceptance does not always mean adopting a doxastic attitude to the proposition; accepting an apology, for example, means believing that the apologizer bears some responsibility for the act for which the apology is offered and that this act was wrong and that the apologizer is sincerely sorry for this act, but it also means forgiving the apologizer, in the sense of not demanding further acts of contrition, reparation or penitence.

Arguments do not always include illatives, and even those that do include illatives typically attach them to only one component of the argument, a reason or the conclusion. But components of an argument not introduced by an illative are nevertheless premissed or concluded. Thus an argument is a claim-reason complex consisting of an act of concluding (which may be of any of the five main types in Searle’s taxonomy of speech acts) and one or more acts of premissing (each of which is an assertive). These acts are correlative; the act of concluding is an act of concluding from the reasons, and each act of premissing is an act of offering support for the conclusion. To capture this relationship, it is appropriate to conceive of an argument as a sequence consisting of a set of reasons followed by a conclusion indicator followed by a conclusion, or equivalently as a conclusion followed by a premiss indicator followed by a set of one or more reasons. In such a sequence, the illative does the work of premissing each reason and concluding the conclusion; hence, we do not need to mention these acts in characterizing the reason and conclusion. Arguments with no explicit illative can be regarded as having one implicitly.

So far I have been talking about actual arguments, actually advanced by people who speak, write or otherwise communicate them to one or more addressees. For the purposes of this chapter, I propose to extend the concept of argument further, in two respects. First, I propose to count as arguments discursal claim-reason complexes that are merely entertained in thought, such as the pros and cons considered by people trying to come to a decision about what to do. The example fits ordinary usage, since we do talk about such people as considering the relevant arguments. But the general characterization goes beyond it, since it includes reasoning by oneself to a conclusion (*tomorrow is garbage day, so I had better put out the garbage*), whose content is not usually described as an argument. The reason for this extension is that the same considerations of acceptability of the supporting reasons and sufficiency of the support relation between reasons and conclusion apply to such solo reasoning as apply to other-directed arguments. Second, for the same reason, I propose to count as arguments merely potential discursal claim-reason complexes never uttered or even mentally entertained by anyone.

In this extended sense, a simple argument is a sequence of three objects: a speech act *c* of any type concerning some proposition, an illative such as the word “since” (in its inferential sense), and a set *P* of one or more assertives. Expressed in this canonical form, the following would count as

arguments:

<express admiration for Picasso's *Guernica*, since, {assert that Picasso's *Guernica* brings home in a vivid way the horrible consequences for the innocent of aerial bombing in contemporary warfare}>

<suspect that Goldbach's conjecture is correct, since, {assert that mathematicians have found no counter-example in 200 years of trying}>

These sequences may be purely possible ones, never articulated by anyone. The first could be expressed by saying, "What a wonderful painting is Picasso's *Guernica*. It brings home in a vivid way the horrible consequences for the innocent of aerial bombing in contemporary warfare." The second could be expressed by saying, "Goldbach's conjecture is probably correct, since mathematicians have found no counter-example in 200 years of trying."

General as it is, this definition is still less general than our ordinary usage of the word "argument". For the same argument can be expressed in different ways, and even in different languages. To accommodate this fact, we can extend the above definition to the equivalence class of all sequences with the same meaning as a given sequence. If $\langle c, \therefore, P \rangle$ is the given sequence, we may label its equivalence class $[\langle c, \therefore, P \rangle]$. It will include sequences with one or more constituents with the same meaning as the corresponding constituent of $\langle c, \therefore, P \rangle$, as well as corresponding sequences in the reverse order with a conclusion indicator in place of the premiss indicator, such as $\langle P, \therefore, c \rangle$. Then a simple argument may be defined as follows:

Simple argument =_{df} a class of those triples of the form $\langle c, \therefore, P \rangle$ or $\langle P, \therefore, c \rangle$ that are equivalent in meaning to one another, where c is an attitude to some object, \therefore is a premiss indicator, \therefore is a conclusion indicator, and P is a set of one or more assertives.

Following traditional terminology, we will refer to an assertive in such a set P as a *premiss* and to such an attitude c as a *conclusion*. Our usage is however non-traditional in this respect, that a premiss is neither a sentence nor a proposition nor a statement, but an assertive; and a conclusion is neither a sentence nor a proposition nor a statement, but a speech act of some type. Further, it should be noted that, in actual thinking, speaking, signing and writing, arguments often lack an inference indicator, the force of the illative being communicated by a combination of semantic and contextual factors.

The definition of a simple argument just proposed is vague, since it is indeterminate in some cases whether two linguistic expressions of an attitude have the same meaning. The vagueness is similar in degree to, and has the same source as, the vagueness in the concept of a proposition as the eternal object signified by the utterance of a sentence. A more precise conception of argument could be obtained by treating each linguistic variation in the formulation of an argument as a new argument. Someone who adopted this approach would confront vagueness at another place, in considering whether two distinct arguments have the same force.

So far we have been considering arguments in which one or more reasons are offered in direct support of a conclusion. A comprehensive conception of argument should allow for complex arguments, in which one or more of the reasons offered in direct support of a conclusion is in turn argued for. Such complex arguments can be analysed into component simple arguments. Anselm's ontological argument for the existence of God in the second chapter of his *Proslogium*, for example, is a tightly structured chain of inter-linked simple arguments. We can extend our definition to complex arguments, with the help of the concept of subordination, defined as follows:

Subordinate argument =_{df} an argument whose conclusion is a premiss of another argument. Subordinate arguments are commonly referred to in the informal logic literature and textbooks as *subarguments*. We need also the concept of superordination, which is the converse relation:

Superordinate argument =_{df} an argument with a premiss that is the conclusion of another argument.

We can now define a complex argument as a set of two or more simple arguments, with a hierarchy of subordination between them:

Complex argument =_{df} a set of two or more simple arguments, each of which is either superordinate to or subordinate to at least one other argument in the set, and one of which (the *main argument*) is not subordinate to any other argument in the set.

We can illustrate this definition with the concluding part of the first book of Plato's *Republic*, where Socrates argues, with the agreement of Thrasymachus at each step, that injustice is never more profitable than justice:

... a just soul and a just man will live well, and an unjust one badly.

Apparently so, according to your argument.

And surely anyone who lives well is blessed and happy, and anyone who doesn't is the opposite.

Of course.

Therefore, a just person is happy, and an unjust one wretched.

So be it.

It profits no one to be wretched but to be happy.

Of course.

And so, Thrasymachus, injustice is never more profitable than justice.

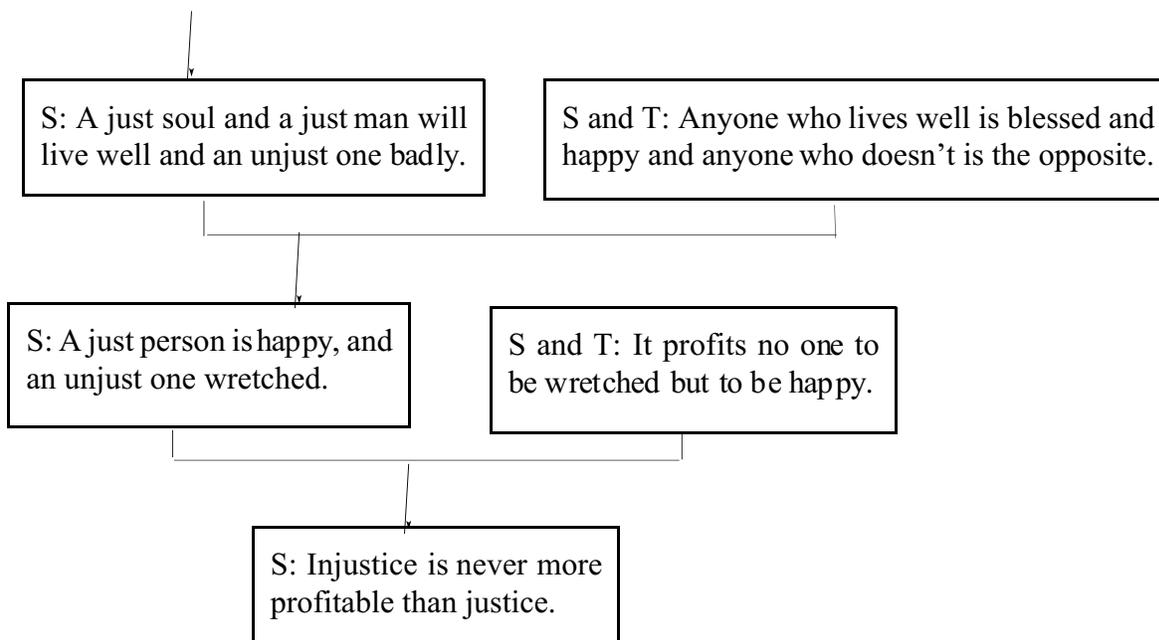
Let that be your banquet, Socrates, at the feast of Bendis.

(Plato, *Republic* I. 353e-354a, Grube-Reeve translation)

This excerpt is the concluding part of a single extremely complex argument, in which attitudes are expressed to about 50 different propositions. The excerpt can be represented in the standard notation for sets and sequences as follows:

{<{assert that a just soul and a just man will live well and an unjust one badly, assert that anyone who lives well is blessed and happy and anyone who doesn't is the opposite}, ∴, assert that a just person is happy, and an unjust one wretched>, <{assert that a just person is happy and an unjust one wretched, assert that it profits no one to be wretched but to be happy}, ∴, assert that injustice is never more profitable than justice>}

In a standard box-arrow system of diagrammatic representation, the argument is as follows:



Thus this text is a complex of two simple arguments, each with two premisses, with the conclusion of the subordinate argument identical to one premiss of the main argument. Both Socrates and Thrasymachus independently affirm each of the ultimate premisses. Thrasymachus gives only grudging acknowledgement of the conclusions that Socrates draws in each simple argument, including the conclusion of a previous argument with which the quoted excerpt begins. Further, the argument is reported, not advanced in his own name by its author (Plato).

The preceding definition covers direct arguments to a conclusion. It needs to be expanded to cover as well *reductio ad absurdum* arguments, suppositional arguments with a conditional conclusion, and other arguments in which a conclusion is drawn on the basis of an argument. The easiest way to accommodate such arguments is to expand the concept of a premiss so that it includes not only assertives but also arguments (which are complexes of illocutionary acts). Consider for example Euclid's proof that there are more than any given [finite] number of primes:

The prime numbers are more numerous than every given number of prime numbers.

Let the given prime numbers be A, B, C. I say that there are more prime numbers than A, B, C.

For let the least number measured [i.e. divisible–DH] by A, B, C be taken and let it be DE, and let a unit DF be added to DE. Then EF either is prime or not.

A _____
 B _____
 C _____
 E _____ D F

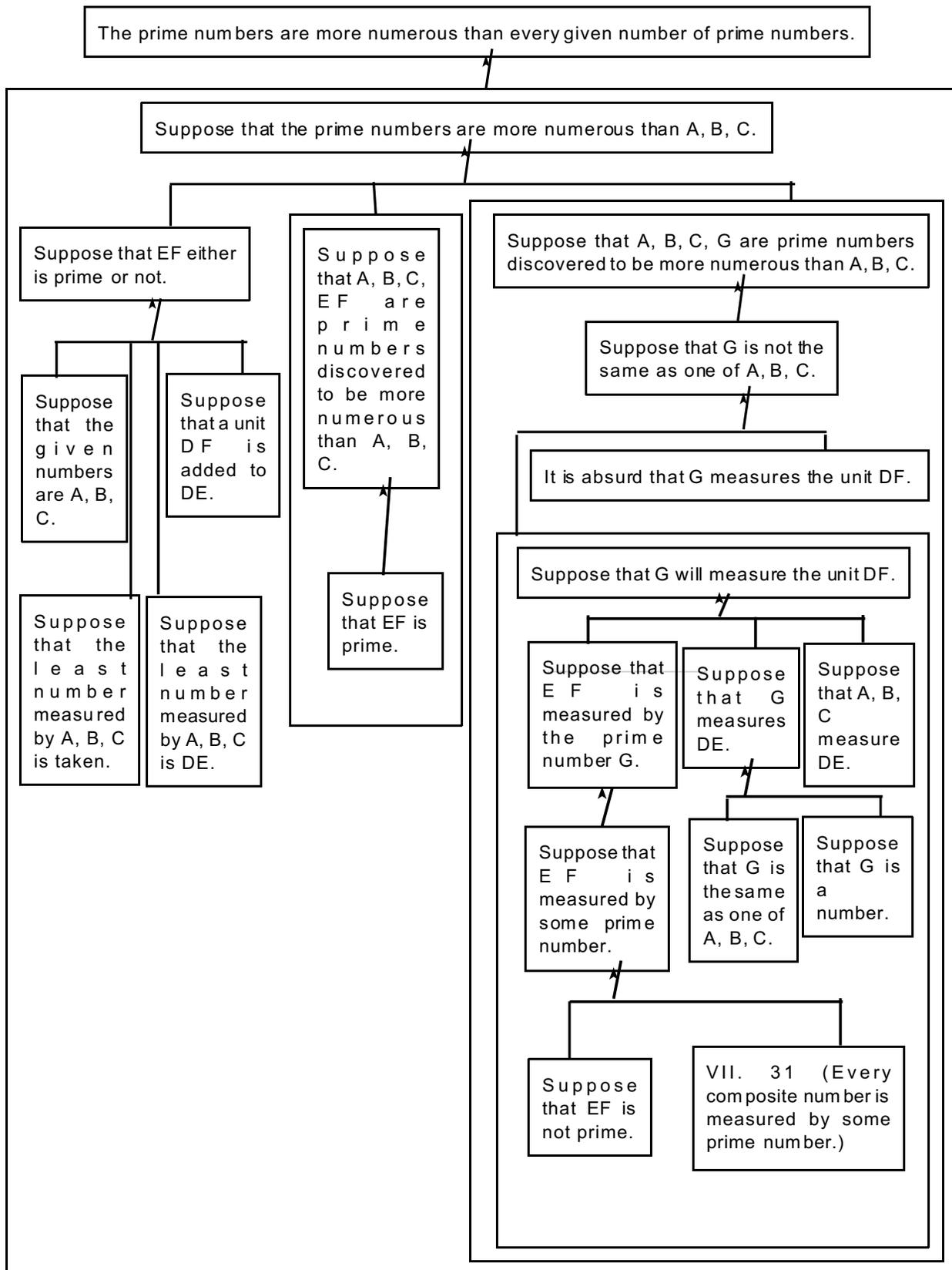
First, let it be prime. Therefore A, B, C, EF are prime numbers discovered to be more numerous than A, B, C.

Next, let EF not be prime. Therefore it is measured by some prime number. (VII. 31) Let it be measured by the prime number G. I say that G is the same as none of A, B, C. For if it is possible, let it be so. A, B, C measure [i.e. are factors of–DH] DE, and therefore G will measure DE. And it measures EF. And being a number G will measure the unit DF, which is absurd. Therefore G is not the same as one of A, B, C. And therefore it is supposed that G is not the same as one of A, B, C; and it is supposed prime. Therefore A, B, C, G are prime numbers discovered to be more numerous than A, B, C; which it was necessary to prove. (Euclid, *Elements* IX.20; translation by the present author)

Euclid's proof is a simple argument with several layers of embedding. It can be represented in the standard notation for sets and sequences as follows:

<assert that the prime numbers are more numerous than every given number of prime numbers, ∴, <{suppose that the given prime numbers are A, B, C; suppose that the least number measured by A, B, C is taken; suppose that the least number measured by A, B, C is DE; suppose that a unit DF is added to DE}, ∴ suppose that EF either is prime or not>, <{suppose that EF either is prime or not, <{suppose that EF is prime}, ∴, suppose that A, B, C, EF are prime numbers discovered to be more numerous than A, B, C>, <{<{suppose that EF is not prime, assert VII.31}, ∴, suppose that EF is measured by some prime number>, <{suppose that EF is measured by some prime number}, ∴, suppose that EF is measured by the prime number G>, <{suppose that G is the same as one of A, B, C, suppose that A, B, C measure DE}, ∴, suppose that G will measure DE>, <{suppose that EF is measured by the prime number G, suppose that G will measure DE, suppose that G is a number}, ∴, suppose that G will measure the unit DF>}, assert that it is absurd that G measures the unit DF}, ∴, suppose that G is not the same as one of A, B, C>, <suppose that G is not the same as one of A, B, C}, ∴, suppose that A, B, C, G are prime numbers discovered to be more numerous than A, B, C>}, ∴, suppose that the prime numbers are more numerous than A, B, C>}>

The outermost argument supports a universal generalization with an argument that an arbitrarily chosen instance has the property of interest. This embedded argument is an argument by cases, whose premisses are a supposition about what the two cases are (supported by a sub-argument) and two embedded arguments reaching the desired conclusion for each case. The argument for the first case is very simple. The second is complex, with a main premiss supported by a *reductio ad absurdum* argument which is the heart of the proof. We can diagram the whole argument as follows:



Thus allowing arguments to be premisses permits one to represent in a uniform way generalizations from a result proved for an arbitrarily chosen instance, proofs by cases, and *reductio ad absurdum* arguments. Similarly one can represent proofs by conditional reasoning, as in Saint Anselm's ontological argument for the existence of God:

Truly there is a God, although the fool has said in his heart, There is no God.

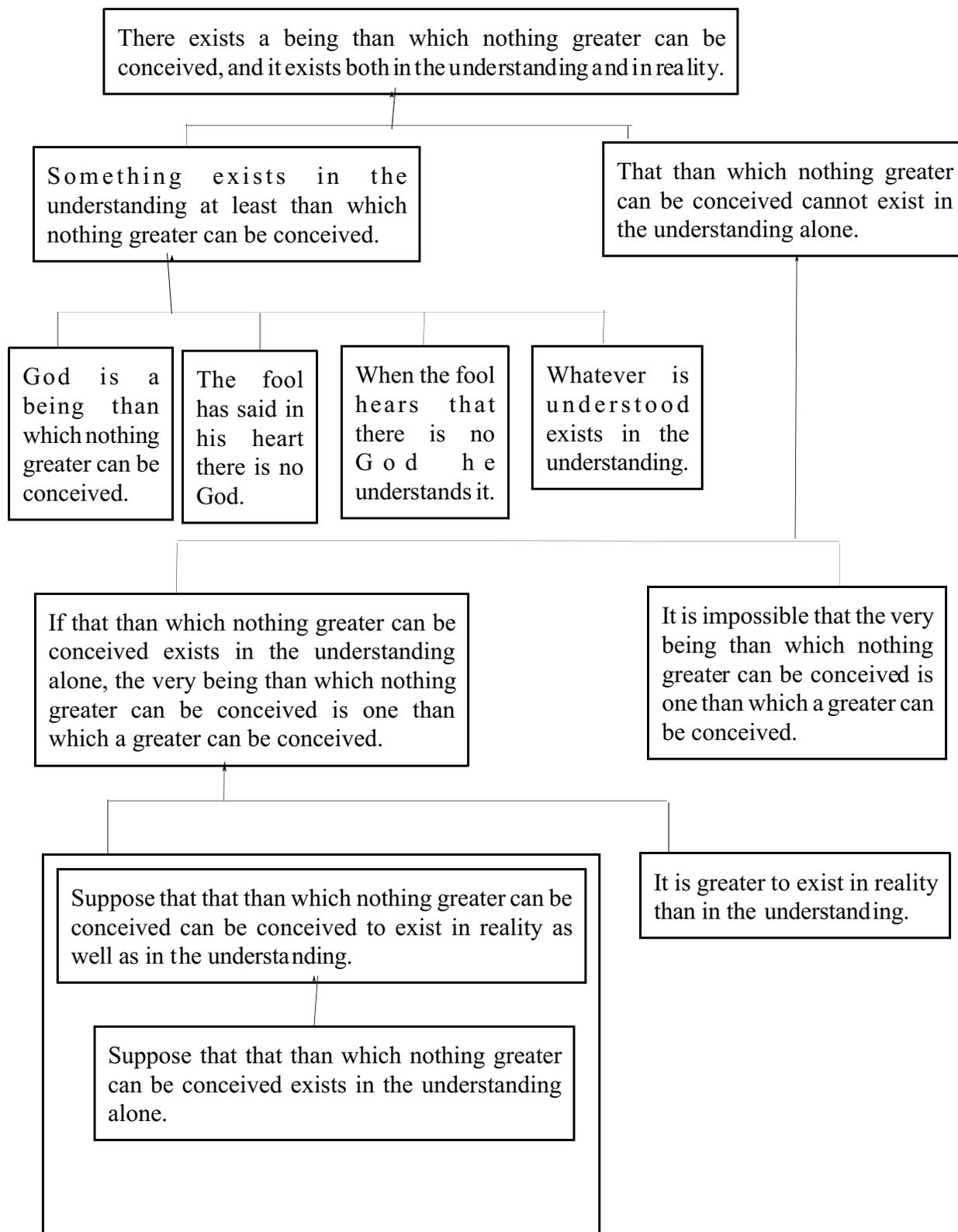
AND so, Lord, do you, who do give understanding to faith, give me, so far as you knowest it to be profitable, to understand that you are as we believe; and that you are that which we believe. And indeed, we believe that you are a being than which nothing greater can be conceived. Or is there no such nature, since the fool has said in his heart, there is no God? (Psalms xiv. 1). But, at any rate, this very fool, when he hears of this being of which I speak—a being than which nothing greater can be conceived—understands what he hears, and what he understands is in his understanding; although he does not understand it to exist.... Hence, even the fool is convinced that something exists in the understanding, at least, than which nothing greater can be conceived. For, when he hears of this, he understands it. And whatever is understood, exists in the understanding.

And assuredly that, than which nothing greater can be conceived, cannot exist in the understanding alone. For, suppose it exists in the understanding alone: then it can be conceived to exist in reality; which is greater. Therefore, if that, than which nothing greater can be conceived, exists in the understanding alone, the very being, than which nothing greater can be conceived, is one, than which a greater can be conceived. But obviously this is impossible.

Hence, there is no doubt that there exists a being, than which nothing greater can be conceived, and it exists both in the understanding and in reality. (Anselm, *Proslogium* 2, Deane's translation; paragraphing altered to facilitate understanding)

Anselm's argument can be represented in the notation of sets and sequences as follows: {<{assert that God is a being than which nothing greater can be conceived, assert that the fool has said in his heart there is no God, assert that when he hears of this he understands it, assert that whatever is understood exists in the understanding}, ∴, assert that something exists in the understanding, at least, than which nothing greater can be conceived>, {<{suppose that that than which nothing greater can be conceived exists in the understanding alone}, ∴, suppose that that than which nothing greater can be conceived can be conceived to exist in reality as well as in the understanding>, assert that it is greater to exist in reality than to exist in the understanding alone}, ∴, assert that if that than which nothing greater can be conceived exists in the understanding alone the very being than which nothing greater can be conceived is one than which a greater can be conceived>, <{assert that if that than which nothing greater can be conceived exists in the understanding alone the very being than which nothing greater can be conceived is one than which a greater can be conceived, assert that it is impossible that the very being than which nothing greater can be conceived is one than which a greater can be conceived}, ∴, assert that that than which nothing greater can be conceived cannot exist in the understanding alone>}, <{assert that something exists in the understanding, at least, than which nothing greater can be conceived, assert that that than which nothing greater can be conceived cannot exist in the understanding alone}, ∴, assert that there exists a being than which nothing greater can be conceived and it exists both in the understanding and in reality>}

Diagrammatically, Anselm's argument looks as follows:



The main argument has two premisses, each an assertion. The first main premiss is supported by a simple argument with four premisses, each an assertion. The second main premiss is supported immediately by two premisses, one an assertion of a conditional and the other an assertion of the impossibility of its consequent. The assertion of the conditional is in turn supported by two premisses, one of them an argument from the supposition of the antecedent of the conditional to a suppositional conclusion and the other an assertion.

The approach of allowing arguments as premisses also permits one to represent proofs by mathematical induction in the same uniform way.

In summary, one can integrate the foregoing considerations into a single recursive definition of an argument, as follows:

1. Any set of the form $\{ \langle c, \therefore, P \rangle \}$ or $\{ \langle P, \therefore, c \rangle \}$ is an argument, where the conclusion c is a speech act of any type, \therefore is a premiss indicator, \therefore is a conclusion indicator, and the set P of premisses is a set of one or more assertives.
2. Any set equivalent in meaning to a set of the form described in clause 1 is an argument.
3. If a conclusion in an argument A is a premiss in an argument B , then $A \cup B$ is an argument.
4. If $\{ \langle P, \therefore, c \rangle \}$ is an argument, and A is an argument, then so are $\{ \langle A \cup P, \therefore, c \rangle \}$ and $\{ \langle A, \therefore, c \rangle \}$. Similarly for $\{ \langle c, \therefore, P \rangle \}$.
5. Nothing is an argument unless it can be constructed in a finite number of steps using the above rules

To appreciate the force of the preceding definition, one can compare it to recent thematic discussions of the concept of argument.

Charles Hamblin in his classic chapter “The concept of argument” (1970: 224-252) develops an account of what an argument is from the generally agreed conception of an argument as “whatever it is that is typically expressed by the form of words ‘ P , therefore Q ’, ‘ P , and so Q ’, ‘ P , hence Q ’; or, perhaps, ‘ Q , since P ’, ‘ Q , because P ’”, and cites Whately’s *Elements of Logic* (1848) for the standard terminology of “premisses” for whatever is expressed by P in such forms and “conclusion” for whatever is expressed by Q (228). He approaches indirectly the task of saying what is typically expressed by such forms of words, through the question of what constitutes a good argument. This question he addresses dialectically, first enunciating a set of “alethic” criteria based on the concept of truth, then overcoming their inadequacy by shifting to a set of epistemic criteria based on the concept of knowledge, and then in turn overcoming the inadequacy of the epistemic criteria by shifting to the following set of dialectical criteria based on the concept of acceptance (by a single person or by a group of persons):

(D1) *The premisses must be accepted.*

(D2, 3) *The passage from premisses to conclusion must be of an accepted kind.*

(D4) *Unstated premisses must be of a kind that are accepted as omissible.*

(D5) *The conclusion must be such that, in the absence of the argument, it would not be accepted.* (Hamblin 1970: 245, italics in original)

Hamblin does not say in so many words what account of argument these criteria imply. If we assume that the criteria for a good argument, like the criteria for a good pruning knife or for a good eye, are those that are jointly sufficient and individually necessary for it to do its work well, then Hamblin’s criteria imply that an argument has as its function to secure acceptance of its conclusion by its addressee(s). Thus we may attribute to Hamblin a definition of an argument as an attempt to compel

one or more people to accept an expressed conclusion Q by adducing in its support some premisses P . This definition is more restrictive than the conception advanced by the present author in this chapter, in at least three respects. First, it covers only simple arguments, not complex ones. Second, it does not explicitly allow an argument to be a premiss. Third, and most importantly, it restricts arguments to a single function; considerations for and against a certain decision that one rehearses to oneself do not count as arguments, nor is there any allowance for arguments designed to prove or justify their conclusion, where acceptance is not enough and perhaps not even necessary. Hamblin's definition differs from the preceding conception in at least two additional respects. Rather curiously, he does not treat a linguistic communication of the form " P , therefore Q " as an argument; rather, an argument for him is what such a form of words expresses, i.e. some sort of abstract object, whose components and ontological status he does not specify. In addition, he makes no allowance for modal qualification of premisses and conclusions, e.g. in suppositional arguments.

Douglas Walton (1990: 411) proposes to define argument as

a social and verbal means of trying to resolve, or at least contend with, a conflict or difference that has arisen between two (or more) parties. An argument necessarily involves a claim that is advanced by at least one of the parties.

This definition fits the disputational sense of "argument" much better than the reason-giving sense. It includes among arguments verbal exchanges of conflicting claims (A: *Yes, you did.* B: *No, I didn't.*) in which the parties give no supporting reasons. It excludes written texts whose authors provide reasons to support a claim that nobody has ever questioned or rejected, for example, mathematical proofs of theorems which nobody has previously thought about. It also excludes discourses in which a speaker makes a case for a claim that the listeners already accept, as a way of reinforcing the adherence of the audience to the claim (as in preaching to the converted). There may be a point to focusing theoretically on verbal expressions of conflict, but it would be less confusing to use some other word than "argument" for them. Perhaps "disputation" would be a better word.

Robert Pinto (2001b), as already noted, distinguishes inference, "the mental act or event in which a person draws a conclusion from premisses, or arrives at a conclusion on the basis of a body of evidence" (32), from argument, initially characterized as "a set of statements or propositions that one person offers to another in the attempt to induce that other person to accept some conclusion" (32). The success of such an attempt, he points out, is not just a matter of its causing its addressee(s) to accept its conclusion; for example, if someone concedes the conclusion merely out of exhaustion from an argument's overwhelming length and complexity, then the argument has not persuaded this addressee to accept its conclusion. What is crucial is that the addressee make the mental inference that corresponds to the move in the argument from premisses to conclusion. Thus "arguments are invitations to inference" (Pinto 2001b: 37). This conception of argument has been central to the development of the definition proposed in this chapter. But Pinto's conception differs from the present definition in that it treats arguments as products with a particular purpose (to get the addressee to accept the conclusion) rather than as abstract objects that might be used for various purposes.

Ralph Johnson proposes the following definition:

An argument is a type of discourse or text—the distillate of the practice of argumentation—in which the arguer seeks to persuade the Other(s) of the truth of a thesis by producing the reasons that support it. In addition to this illative core, an argument possesses a dialectical

tier in which the arguer discharges his dialectical obligations. (Johnson 2000: 168)
 The practice of argumentation to which Johnson refers in this definition he defines as “the sociocultural activity of constructing, presenting, interpreting, criticizing, and revising arguments.” (Johnson 2000: 12, 154) The present author has argued, and Johnson has apparently accepted (Johnson 2002: 313), that his intention is best captured by adding to this definition of the practice the qualifying phrase “for the purpose of reaching a rationally shared position on some issue” (Hitchcock 2002: 291). Further, to avoid the circularity of defining arguments in terms of argumentation and argumentation in terms of arguments, Johnson must recognize explicitly in his definition of argument (as he does implicitly elsewhere in his book) that arguments occur in contexts other than that of argumentation. The following revision of Johnson’s definition of argument, intended to meet this and other difficulties, is one that Johnson apparently accepts (Johnson 2002: 313):

An argument is a spoken discourse or written text whose author (the arguer) seeks to persuade an intended audience or readership (the Other or the Others) to accept a thesis by producing reasons in support of it. In addition to this illative core, an argument possesses a dialectical tier in which the arguer discharges his dialectical obligations. (Hitchcock 2002: 289)

The dialectical obligations to which Johnson refers are obligations to address objections to and criticisms of the illative core and to consider alternative positions. In response to criticism of his controversial requirement that arguments must have a dialectical tier, Johnson has clarified his position: not all arguments have a dialectical tier, but “the *paradigm* case of an argument—the one that we should base our theories on and make policies over—is that in which there is both illative core and dialectical tier” (Johnson 2002: 316). The definition of argument proposed in the present chapter clearly differs from Johnson’s definition in treating arguers’ discharge of their dialectical obligations as extrinsic to their actual argument. The exclusion of such dialectical material from arguments proper conforms to our ordinary usage of the term “argument”, and is compatible with Johnson’s insistence that arguers have a responsibility to discharge their dialectical obligations. It might be better to use the word “case” for the whole complex consisting of an argument and its dialectical penumbra.

Johnson’s definition differs from the definition proposed in this chapter in at least two additional respects. It restricts arguments to actual discourses or texts rather than considering them as abstract objects that may be unexpressed. And it requires that their authors have as their purpose to persuade an intended recipient to accept a thesis on the basis of the reasons supplied, whereas the definition proposed in the present chapter leaves undetermined the purpose for which someone might express an argument. In defence of the latter position, one might point out that it is possible to include an argument as part of a joke, or that scholars and scientists who make a case for some position in academic writing may be more concerned to get on the record a solid justification of the position than to actually persuade any particular person or persons to accept it. In general, then, there is a variety of purposes for which people express arguments.

J. Anthony Blair (forthcoming) construes arguments as reasons for something: for beliefs or for believing, for attitudes or for emotions, or for decisions about what to do. A set of propositions is a reason for something if and only if they actually support it. Blair justifies his abstract conception by pointing out that arguments as we ordinarily understand them have many uses—not just

persuasion, but also quasi-persuasion, inquiry, deliberation, justification, collaboration, rationale-giving, edification, instruction and evaluation. Hence it distorts our ordinary understanding of arguments to build into the definition of argument some particular purpose such as persuasion or the resolution of a conflict of opinion.

Blair's general approach of treating an argument as an abstract object that can be used for various purposes corresponds to the approach of the present chapter, as does his catholicity about the types of objects that can serve as conclusions of an argument. It differs from the approach of the present chapter in that it requires that the premisses of an argument actually support its conclusion, and indeed that none of the premisses is superfluous. He recognizes that people sometimes offer as a reason some consideration that does not in fact support the conclusion drawn from it. On his view, such people take themselves to be advancing an argument, but in fact they are not doing so. The term "argument" thus acquires a normative force, something like the force that the term "art" or "music" has in some people's usage. Blair's restriction of arguments to structures in which the premisses actually support their conclusion clearly departs from our actual use of the term "argument". Further, it is theoretically awkward, since informal logic deals with the identification, analysis, evaluation and criticism of inferentially bad arguments as well as inferentially good ones. What name then will Blair use for its subject-matter? The restriction of arguments to inferentially good ones appears to be motivated by Blair's treatment of an argument as a set, one of whose members is the conclusion and the rest of which are the premisses. Without a requirement that the premisses actually support the conclusion, every set of propositions would count as an argument—a classification clearly at odds with our ordinary usage. The present chapter avoids such an overly broad conception by treating a (simple) argument as a sequence, with an illative as well as premisses and conclusion. It also differs from Blair's conception in allowing complex arguments and in allowing an argument to be a premiss.

Further clarification of the force of the definition of argument proposed in the present chapter should emerge from a consideration of the sorts of objects that the definition excludes as not being arguments.

First, not all persuasive communication counts as an argument in the sense defined. Students of persuasion commonly accept the distinction already pointed by Aristotle (*Rhetoric* I.2.1356a1-20) of a variety of means of persuasion: character, emotion, argument (in Greek *êthos*, *pathos*, *logos*). Presentation of oneself as having a certain character may enhance the credibility of what one says, but it is not an argument in the sense defined in the present chapter, since it lacks a premiss-conclusion structure. For the same reason, stirring up the emotions of one's audience is not in itself an argument, even though it may be more effective than argument at moving them, and even though it can be combined with argument. Talk of "ethotic argument" and "pathetic argument" blurs an important distinction among different means of persuasion. Similarly, not all advertising contains arguments. Some advertising, for example legal advertising, is purely informative. But even persuasive advertising often works by presenting the product or service in an appealing manner, by creating associations through visual imagery, or by providing detailed information about it. Only advertising with an explicit premiss-conclusion structure counts as an argument according to the definition of the present chapter.

Second, insinuation is not argument. Although someone who insinuates something invites the hearer or reader to draw a conclusion from their words, the words themselves do not draw that

conclusion. One can of course identify and discuss the argument that the insinuator invites us to construct for ourselves. Typically, however, this argument is rather indeterminate, precisely because insinuation merely suggests.

Third, some visual, emotional, visceral and kisceral communication is argumentative. But some is not, even if it has a persuasive function. Images can supplement written words as part of an argument. The drawings of lines that accompany Euclid's proof that there are more primes than any given number of primes enhance one's understanding of the suppositions he makes and of the construction that is at the heart of the proof; they can be interpreted as a visual repetition of what is written in words. A diagram of an experimental apparatus serves a similar function of supplementing a parallel verbal description in the methods section of a scientific paper. Visual images can also function as ineliminable components of an argument. A poster with a giant photograph of a starving emaciated child and the words "make poverty history" can reasonably be construed as an argument in the sense defined in this chapter; its premiss is the situation exhibited in the photograph, whose information content exceeds that of any verbal description, and its conclusion is the directive of the written text. But visual images that merely suggest a conclusion to be drawn by the viewer are not arguments in the sense defined in this chapter, because they do not contain a conclusion. Similarly, emotional expressions can have a persuasive effect without being part of an argument; for example, a conciliatory tone of voice may help persuade someone to calm down, but it is not part of an argument unless the speaker in so many words urges the addressee to calm down and states some reason for her or him to do so. Likewise with visceral communication; a threatening gesture may persuade someone to accede to some implied request, but it becomes part of an argument only when the gesturer says, "Your money or your life", or words to that effect. As for Gilbert's "kisceral" mode, it is debatable whether the intuitions or hunches to which it refers are communicative devices, as opposed to a type of evidence analogous to direct observation. Of course, a person may cite their intuitive feeling as a reason for a certain belief or decision, but in that case the premiss is the assertion that they have this feeling, rather than the feeling itself.

To sum up, this chapter has proposed a definition of an argument as a set of one or more interlinked premiss-illative-conclusion sequences. Such sequences can be interlinked either through chaining together, when the conclusion of one sequence is a premiss of another, or through embedding, when one sequence is a premiss of another. A premiss is an assertive, conceived as not necessarily asserted by anyone, and a conclusion is a speech act of any type, conceived as not necessarily performed by anyone or urged upon any addressee. In other words, arguments are abstract structures. When expressed, whether in language or in images or in physical behaviour, an argument invites its addressees to accept each conclusion on the basis of the acceptance of the assertives in its immediately supporting reasons.

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