ISSA Proceedings 2002 – Formal Logic's Contribution To The Study Of Fallacies

Abstract

Some logicians cite the context-relativity of cogency and maintain that formal logic cannot develop a theory of fallacies. Doing so blurs the distinction between ontic and epistemic matters and engenders a subjectivism that frustrates the project of logic to establish objective knowledge. This paper reaffirms the distinction between ontic and epistemic matters by establishing objective criteria for truth, validity, and cogency. It emphasizes the importance of the ontic notion of logical consequence underlying intelligible discourse. By clarifying a notion of fallacy it shows how formal logic contributes to fallacy theory.

1. The project of informal logic

The desire of critical thinking theorists, pragma-dialecticians, and informal logicians to dethrone formal logic has animated and defined their movement since its inception in the 1970s. In general, three matters mark their dissatisfaction with formal logic.

1. They believe that the mathematical development of formal logic has led to its becoming irrelevant to the needs of everyday discourse whose medium is natural language.

2. They maintain that it focuses too narrowly on the implicational relationships among propositions and relegates to the extralogical 'everything else' important to the evaluation of arguments.

3. They criticize its being asymmetrical in respect of its inability to formalize fallacious reasoning and even invalidity as it has been able to develop decision procedures for valid arguments.

Wanting to analyze informal fallacies and to develop a typology to categorize them impelled informalists to develop alternative theories of argumentation. These matters have remained core concerns for them. Two essential features of arguments underpin their complaint about the posture and project of traditional

logic.

1. They take an argument to consist in considerably more than a set of propositions, where one is thought to follow *logically* from others. Rather, an argument consists in a set of premises that allegedly support a conclusion with an intention to change someone's belief. An argument is a dynamic *social activity.* Thus, argument analysis requires recognizing the question-answer, or the challenge-response, nature of interactive dialogue.

2. They insist on the *contextuality* of an argument. A good or bad argument consists in its success or failure to persuade a participant of a belief or to act in a certain way. An argument is evaluated in terms of premise acceptability, premise weight and relevance, and in terms of the suitability of the inferential link between premises and conclusion, all of which are *relative* to persons at times.

By demoting formal analysis of implicational relationships and elevating the contextual and dynamic nature of arguments, these logicians study real-life, ordinary language, arguments. The distinction between matter and form is not important for their method of analysis. In this way they believe themselves to close the gap between logic and the genuine needs of human beings.

2. Three mistakes in reasoning about argumentation
However, when these logicians take an argument to be a dynamic relationship involving an audience or disputants, they make three metasystematic mistakes.

1. By taking an argument to be a social activity with an aim to persuade a participant of one or another belief, they attribute *agency* to an argument when agency is properly a feature of an arguer. They confuse an argument with an arguer, and thus they confuse their respective evaluations.

2. By evaluating an argument in terms of premise acceptability, weight, and relevance, and in terms of suitable inferential links, they relativize cogency to the dispositions of one or another audience.
They destroy an important epistemic/ontic distinction in two respects:
1. they conflate inference and implication; and
2. they conflate thinking and being. A 'good argument' becomes a 'convincing argument' whose goodness is set by the standards of a given audience at a given time, irrespective of whether or not an argument is objectively valid or invalid, an argumentation cogent or fallacious.

3. They confuse 'argumentation theory' with 'persuasion theory', part of which *includes* argumentation, but more narrowly construed as consisting in

propositions and their logical relationships. Here again they tend to confuse evaluating an argument with evaluating the *various skills* of an arguer.

While these logicians desire norms of good argument, they seem unable to provide an objective, or universal, foundation for such norms. Closing the gap between the project of logic and the needs of human beings seems to have provided license for unrestrained arbitrariness when it comes to assessing the cogency of an argumentation. In closing one gap they widened another one more pernicious than the first – that gap between distinguishing knowledge from narrow-minded opinion. When these logicians affirm the participant relativity of argumentation, when they place emphasis on cognitive aspects of argumentation, when they embrace the 'extralogical' within the project of logic, and when they emphasize argument context and the pragmatics of argumentation, they dangerously court psychologism and jeopardize establishing a sound fallacy theory. The *arguer* now takes center stage in this framework of assessment. The project of logic shifts from determining logical consequence to assessing an arguer's ability to package information. Moreover, the *audience* also takes center stage from this perspective. Informal logicians *seem* to have devoted considerable attention to 'good argumentation' when really they have examined empirically *how different human beings make up their minds.* This is rather more a concern of psychology and sociology than of logic. No longer is it a logical question of whether an argument is valid or invalid, etc., but a metasystematic question of whether an argument works or does not work in a given context. This raises a question about the purpose of logic.

3. A classical notion of logic's purpose
Taking logic as a part of epistemology whose goal is to cultivate objectivity, we hold that logic aims to develop concepts, principles, and methods for making a decision according to the facts. The need for logic would be obviated were humans omniscient or infallible. From a classical perspective, logic has been concerned with "the perfection of criteria of proof, the development of objective tests to determine of a given persuasive argumentation whether it is a genuine proof, whether it establishes the truth of its conclusion" (Corcoran 1989b: 37). The feeling of certainty is not a criterion of truth and persuasion is not necessarily proof. Perhaps we can agree with John Corcoran, who construes objectivity to be an important human *virtue*. He writes:
All virtues are compatible with objectivity, and most, if not all, virtues require it in

order to be effectual and beneficial. Without objectivity the other virtues are either impossible or self-defeating or at least severely restricted in effectiveness. (1989b: 38)

By basing human dignity and mutual respect on the universal desire for objective knowledge, we can affirm an essential role of formal logic in everyday life – to overcome ignorance as much as possible. Assuming this posture helps to avoid reducing study of argumentation to psychology, or cognitive science, or even to rhetoric and persuasion theory.

The special problem of the informalist approach to argument analysis is to insist on *contextuality*. This emphasis subverts logic's aim to develop topic neutral methods for establishing knowledge and steers it toward particularist standards of analysis. By declaring that a good argument need not be valid, that fallaciousness and cogency are participant relative, they focus on an agent's ability to manipulate language and situations. This neglects an *ontic underpinning* of truth and falsity, validity and invalidity, and cogency and fallaciousness. If the purpose of argumentation is persuasion, then of course formal logic, which emphasizes logical consequence, is irrelevant, save for encountering participants knowledgeable about formal matters. Concern with formal matters even becomes obstructive. But then to say that someone is mistaken becomes arbitrary. Logic effectively surrenders concern with epistemic methodology and undertakes studying rules for regulating disputational discourse.

4. Woods and Walton attempt to bridge the difference
John Woods and Douglas Walton have been acutely aware of a 'cognitivist' tendency among informal logicians. Their studies of fallacies and argumentation have aimed to avert a collapse of informal logic into a psychologistic quagmire.
With informalists Walton takes an argument to be more than a 'deductive system' of propositions; an argument is a logical dialogue game. He tries to rescue fallacy theory from psychologism by maintaining that a bad argument does not have to *seem* to be valid in order to be a fallacy. Rather, making a case that an argument is bad is a normative claim. The principle underpinning his position is that propositional logic is the *inner core of argument* and that dialogue game is the *outer shell of argument*. However, what Walton gives to formal logic with one hand he takes back with the other. He writes:
But in speaking of criticism in disputation we are importing a framework, a *conception of argument* that *includes more* than just the semantic structure of the

propositions that make up the core of the argument. It includes as well the *pragmatic structure* of certain conventions or rules of argument — locution rules, dialogue-rules, commitment-rules, and strategic rules. (Walton 1987: 95)

Walton's theory of argumentation is firmly ensconced in an informalist framework. This conception of argumentation affects his definitions of formal and informal fallacy. Again, he says:

[Thus] a fallacy is a *type of move in a game* of dialogue *that violates a certain rule of the game.* Such a fallacy may be one of the kinds traditionally called an "informal" fallacy. *Formal fallacies* are those that pertain to the formal logic element, the core of the game that has to do with *relations of validity in the set of propositions* advanced or withdrawn by the players. *Informal fallacies have to do with rules and procedures of reasonable dialogue.* (Walton 1987: 95-96)

Walton reneges on his commitment to the role that formal logic has for argumentation theory and for fallacy theory. He shifts focus from argument assessment to arguer assessment and abandons objective knowledge.

Still, Woods and Walton have aimed to 'formalize' certain aspects of reasoning in ordinary discourse, as their numerous studies of fallacies attest. Woods in particular cites two distinct advantages to using formal methods. "One is the provision of clarity and power of representation and definition. The other is provision of verification *milieux* for contested claims about various fallacies" (Woods 1980: 59). He holds that "being a mathematical system is not necessarily a liability for a theory of the fallacies" even if fallacy theory cannot fully embrace certain mathematical features (Woods 1980: 58). Still, he holds that a fallacy theory need not be constructed along the lines of an axiomatic logistic system, which, in any case, he recognizes to be a virtual impossibility. However, he continues, "we know ... that axiomatic formalization does not exhaust *formal treatment*" (Woods 1980: 59). Woods writes that his and Walton's analyses of the fallacies have considerably benefited by "repos[ing] the theoretical burdens of the fallacies in probability theory, acceptance theory, epistemic and doxastic logic, and rationality theory" (Woods 1980: 60).

This leads me to suggest not that the mature theory of the fallacies is a branch of logic that is essentially informal, but rather that the mature story of the fallacies is a branch of formal theory that is essentially extralogical in major respects. The formal theory of the fallacies is not (just) logic. (Woods 1980: 60)

Woods here, as Walton elsewhere, *vacillates* between the two poles; this

vacillation pivots on an equivocal use of 'formal'. Our primary concern as logicians is not merely with a systematization, or *formalization*, of ordinary language argumentation according to the pragmatics of discourse, but with the inherent cogency or fallaciousness of argumentation. *And this just concerns logical consequence*, the traditional bailiwick of formal logicians. Woods and Walton have aimed to rescue the project of informal logic by employing some of the theoretical apparatus of formal logic, enriched, they believe, by notions of relevance and dialogue. However, they seem not to have fully rescued cogency and extricated the analysis of an argumentation from a contextualism that exposes analysis to unrestricted subjectivism.

5. Argumentation theory a part of persuasion theory
In reasoning about argumentation some logicians persist in confusing the *activity of arguing* with the *activity of persuading*. This confusion leads them to mistake the proper object of argument assessment and to lose sight of a concern with truth and falsity. They mistakenly call an argument good or bad, or right and wrong, when they really assess the arguer and his/her audience. While the goal of a persuader is to convince, the goal of a logician is to assist in establishing knowledge. This is impossible to achieve by basing truth and falsity, validity and invalidity, and cogency and fallaciousness on the subjective predispositions of one or another audience at one or another time.

Invoking Aristotle's notion of the four causes in connection with his notion of *technê* helps to make sense of the complexity of practices in the art of persuasion. In this connection, then, the *final cause* is a desired action on the part of a participant. The *material cause* is a participant. The *formal cause* is a belief. The *efficient*, or productive, cause is a persuader. Arguments, or argumentations, then, are a persuader's instruments. Formal logic perfects an argumental instrument. Just as no saw can cut wood, but the person using the saw cuts wood, so no argumentation can persuade a participant to believe something or to act in a certain way. Rather, an arguer using an argumentation provides *occasion* for a participant to change his/her beliefs. It is a category mistake to attribute agency to an argument. Nor, in truth, does an arguer convince anyone. Rather, presented with information in various *form*s, a participant grasps something in his/her mind as a mental act: this person experiences an ordered chain of reasoning to come to an understanding.

A successful persuader must know his/her own strengths and weaknesses in

respect of the four causes. Considering *the entire* arena of persuasion, there are many points of evaluation: how adept a speaker is with rhetorical devices or knowledge of language and especially with knowledge of an audience's beliefs. Considering *only* the argumentation itself, we assess it as an argumental *instrument*. An argumentation, then, can be assessed as a good or bad instrument independent of a context and, thus, independent of the beliefs of an audience. The question "Is it a good argumentation?" for a logician is analogous to the question "Is it a good saw?" for a cabinetmaker. Being a good saw is independent of the wood it is used to cut. Of course, we are working within a domain and thus with 'intended interpretations', that is, with intended uses. Nevertheless, granting this, a good saw involves: being composed of the right metal, having the right temper; the right shape, the right handle, weight, balance, number of teeth, angle of teeth, sharpness, etc. All this is distinguished from being the right tool for a function, which is relative to a task. An argumentation, then, can be assessed independently in respect of its propositional relations. A good argumentation involves: absence of ambiguity; having no smuggled premises; a conclusion that is a logical consequence of the premises; having a chain of reasoning cogent in context; etc. Of course, assessing an argument involves extracting the propositions expressed by ordinary language sentences and then checking them against the models established by formal logic.

6. Propositions, arguments, argumentations

Philosophers and logicians recognize different definitions of truth. Here we employ a correspondence notion along the lines of Aristotle, Tarski, and others to help assess argumentation objectively. Aristotle considered the truth or falsity of a sentence to depend on whether a given state of affairs is or is not the case, but not that a given state of affairs is dependent on the truth or falsity of a given sentence (see *Categories 12*: 14b14-22). He would also consider the validity of a given argument to have an ontic underpinning, since the ontic nature of the law of contradiction undergirds 'truth following being'. There is an underlying ontology for truth and falsity and for validity and invalidity that makes impossible that true propositions imply a false proposition and that makes these matters participant independent. This ontology takes argument evaluation out of relativistic considerations and provides for a *formal* assessment.

An object language sentence might express one or more proposition. While a sentence might be ambiguous, a proposition is not. A proposition is true or false

just in case the state of affairs denoted by the proposition is or is not the case. A premise-conclusion (P-c) *argument* to be a two-part system consisting in a set of propositions called premises (P) and a single proposition called a conclusion (c). In a valid argument the premise propositions imply the conclusion proposition, the conclusion is a logical consequence of the premises. Another way of expressing validity is to say that in a valid argument all the information in the conclusion is already contained in the premises (Corcoran 1998). Truth and falsity and validity and invalidity are ontic properties of propositions and arguments respectively. One way to establish knowledge of an argument's validity is to find a chain of reasoning (a derivation) that is cogent in context that helps to link in the mind of a participant the conclusion to the premises as a logical consequence. We define formal derivation as follows:

A given proposition c is formally deducible from a given set of propositions P when there exists a finite sequence of propositions that ends with c and begins with P such that each proposition in the sequence from P is either a member of P or a proposition generated from earlier propositions solely by means of stipulated deduction rules.

Thus, an *argumentation* is a three-part system consisting in a set of propositions called premises, a single proposition called a conclusion (the bounding argument), and a sequence of propositions called a chain of reasoning. If the chain of reasoning is cogent in context and the bounding argument is valid, we have a deduction, otherwise a fallacy. Cogency and fallaciousness are properties of argumentations, not beliefs of a participant.

7. An ontic definition of cogency
With this understanding of argumentation, we can see that a cogent chain of reasoning is an ordered sequence of propositions that are conclusions of elementary valid arguments. Thus, cogency is an ontic property of such a chain. *It is one thing for the sequence to be cogent; it is another thing for someone to understand that this is so*. To affirm that cogency is an ontic property of such a sequence of propositions is to affirm the truth of *the principle of transitivity of consequence*, namely: "every consequence of a consequence of a given proposition is again a consequence of that proposition" (cited in Corcoran 1989a: 34-35). Cogency, then, is an ontic property of a good argumentation, specifically, of a deduction, and its counterpart, fallaciousness, is an ontic property of a bad argument, namely, of a fallacy. This extricates both deductions and fallacies, in

respect of their consisting in propositions, from participant relativity and places responsibility for their recognition squarely on participants.

8. Formalist considerations at the core of intelligible discourse

One project of epistemology is to determine means for establishing knowledge of the truth and falsity of propositions. Traditionally this project has consisted in two processes, induction and deduction. Another project of epistemology is to determine a foundation for, and to discover the means by which to establish knowledge of, *logical consequence.* In this connection, ontology and logic are intimate companions. The contributions of formal logic to the project of establishing knowledge include the following. Formal logic:

*   has articulated the law of contradiction and the law of excluded middle as providing an ontic underpinning for intelligible discourse. These laws relate equally to states of affairs and propositions.

*   has articulated the principle of consistency. This principle equally underlies intelligible discourse and is applicable to various notions of truth.

*   has defined logical consequence as an ontic property existing between propositions. This notion underpins intelligible discourse by which we recognize, for example, the incoherence of a paradox, that true propositions cannot imply a false proposition.

*   has established the principle of form: every argument in the same form as a given valid argument is valid; every argument in the same form as a given invalid argument is invalid.

*   has developed the method of counterargument and method of counterinterpretation to establish knowledge of invalidity.

*   has developed the notion of cogency as consisting in linking the conclusion propositions of elementary valid arguments sequentially in an argumentation, or chain of reasoning. In this connection, formal logic has articulated the principle of transitivity of consequence.

*   has developed the notion of universe of discourse by which one determines what is germane to a specific discourse.

*   has developed a notion of precision in thinking as exemplified in, for example, the ideal of a logically perfect language. The work of semantics and linguistics is important, if only for helping to make more precise the logical form of a given proposition.

*   has established methods that aim at objective knowledge, two of which are the hypothetico-deductive method for disconfirming a hypothesis, or proving it to be

false, and the deductive method used in axiomatic discourse for proving a hypothesis to be true.

* has provided methods useful for discovering hidden consequences of propositions.

Formal logicians develop models – whether of formal or natural languages, of deductive systems, or of argumentations – that serve as *ideals* against which to assess ordinary language discourse.

9. Reasserting the epistemic/ontic gap

Informal logicians have aimed to close the gap between logic and the needs of human beings, but at the cost of eliminating the difference between the *process* of arguing and its context, on the one hand, and the product of such a process, the argumentation itself, on the other. They commit the *process/product fallacy*. And, since a philosophical tenet of informal logic relates to its *context relativism*, their closing the gap between the theory and practice of logic and formal logic's putative irrelevance depends on their adopting a post-modern obliteration of the subject-object distinction that confuses what is known with what is, and thus they are themselves guilty of the *epistemic/ontic fallacy.*

We know that an *ad hominem* argument can be a very effective tool in the hands of an accomplished rhetorician. However, a rhetorician's success *really* rests on at least three factors, all of which pertain to the conditions of a participant:

1. a participant's ignorance of formal logic;

2. a participant's ignorance of facts and information;

3. a participant's lacking a clear commitment to obtaining truth and a willingness to suspend judgment toward that end.

In this connection, then, logicians have two projects:

1. to isolate argumentation as a *part* of persuasion theory; and

2. to apply formal logic to fallacy theory. A constituent part of this work is sharply distinguishing the ontic from the epistemic.

10. Sketching a fallacy theory

If sketching a *fallacy theory* includes providing (1) a definition of *fallacy* and (2) a method of formal analysis, then formal logic offers the following definition, alongside *deduction, refutation*, and *demonstration*. A fallacy is an argumentation in which one or more of the following occurs:

1. the conclusion is not a logical consequence of the premise-set; or

2. the chain of reasoning is not cogent in context, whether or not the argument

bounding the chain of reasoning is valid; or

3. the chain of reasoning is cogent but not in context. These considerations are ontic features of the argumentation that is a fallacy, and thus they are *independent* of participant recognition. Formal analysis of a fallacy might involve any of the familiar methods for determining invalidity and for refutation.

This process (1) is independent of argumentational pragmatics, dialogue rules, and context, and (2) requires extracting an argumentation from a natural language discourse and expressing it precisely with all the tools of formal logic. Using the model of an Aristotelian syllogism, we can show that a fallacy *violates* a valid syllogism *pattern*. In the case of ambiguity, while a given argument with an ambiguity has one grammatical pattern, it really has two underlying logical patterns. And in the case of equivocation, while an argument with an equivocal expression has a given grammatical pattern, it really has, with the addition of a fourth term, an underlying logical pattern different than a syllogism. *Begging the question* might be considered in two ways, neither of which involves fallaciousness.

1. When, among a premise-set, a false proposition taken to be true (or one whose truth-value is undetermined) implies a true proposition, it is a mistake to believe the conclusion to have been proved. Here there is no fallacy or mistake in reasoning. Rather, a participant is ignorant about what counts as a demonstration. Knowing that every true proposition is implied by infinitely many false propositions might help in this situation.

2. When a proposition to be established as a conclusion is itself among the propositions in the premise-set, there is no fallacy. Again there is ignorance on the part of a participant about demonstration. However, here there is a need for a restriction on the deduction system along the lines of Aristotle's requirement for his syllogistic system: the conclusion must extend knowledge beyond what is immediately stated in the premise-set. Finally, the fallacies of *ad hominem* and appeal to authority introduce, or smuggle, additional premises that do not contribute to a conclusion following logically from premises. The other fallacies might be addressed in a similar fashion.

11. Concluding remarks

John Woods and Douglas Walton must feel an intellectual kinship with formal logicians such as John Corcoran because of their equal commitment to objectivity. The question is to what extent is the realization of their commitment

compromised by their equally strong commitment to assessing arguments contextually. Their view of the systematic practice of logic seems incompatible with their view of the metasystematic practice of logic. Nevertheless, they expect that discourse on cogent and fallacious argumentation itself be cogent, and Woods (1989, 1994b, 1999, 2000) in particular hold out a place for formal logic in developing a sound argumentation theory with an analysis of the fallacies.

Critical thinking theorists, pragma-dialecticians, and informal logicians have aimed to diminish the gap between logic and the needs of human beings. However, they have also diminished the gap between knowledge and ignorance. We wish to re-assert that gap in respect of

1. knowledge of the truth and of falsity of a proposition,

2. knowledge of the validity and or invalidity of an argument, and

3. knowledge of the cogency and or fallaciousness of an argumentation. Obscuring this gap is detrimental to human understanding and conflict resolution. Our concern as educators to develop a person's ability to avoid mistakes in the process of drawing conclusions ought to promote their continuing

1. to accumulate knowledge and information and

2. to perfect knowledge of logical consequence. The first project is a matter of science; the second is a matter of formal logic. Mediating conflicting viewpoints is a third matter. Becoming a virtuous person requires developing a lifelong commitment to examination and self-reflection in the pursuit of objective knowledge. Classical formal logic has a *crucial* role to play in that process as it applies to the role of argumentation in everyday life.

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