

Informal factors in the formal evaluation of arguments

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Abstract

In this paper, it is argued that the Oliver-Massey asymmetry - the asymmetry between showing that a given argument is formally valid, and showing that it is formally invalid - does not hold. Both formal validation and invalidation can be justified to a greater or lesser degree. However, both processes are based on formally invalid arguments.

1. Aim

The question I would like to explore in this paper is whether there are significant differences between the process of showing that a given argument is formally valid and the process of showing that a given argument is formally invalid. These two processes may be labeled, for short, the formal validation and the formal invalidation of arguments; furthermore, a significant difference between the two may be labeled an asymmetry. Thus, the problem may be formulated as asking whether there is an asymmetry between the formal validation and the formal invalidation of arguments, and what are the implications of such an asymmetry or lack thereof. In other words, the question is whether there is a logical and epistemological asymmetry in the concepts of formal validity and invalidity.

The motivation underlying this undertaking is two-fold. On the one hand, some philosophers have advanced the thesis that there is an asymmetry between formal validation and formal invalidation, and this strikes me as an intriguing claim whose correctness deserves further scrutiny. On the other hand, I believe that this problem is a fruitful and instructive one for anyone concerned with understanding the relationship between logic and argumentation.

2. Theoretical Context and Conceptual Framework

Before plunging into the details of this problem of formal validation versus formal invalidation, it will be useful to sketch the theoretical, conceptual, and methodological context underlying my investigation. In this inquiry, both formal validation and formal invalidation are regarded as special cases of formal evaluation; moreover, formal validation is also taken to be a special case of positive evaluation, and formal in-

validation is also considered to be a special case of negative evaluation. Similarly, these three kinds of evaluations (formal, negative, and positive) may be regarded as special cases of the evaluation of arguments in general.

Evaluation is here something I would distinguish from the construction and the interpretation of arguments, without however separating these three activities. In other words, the construction, the interpretation, and the evaluation of arguments are interrelated, but that is not to say that they are the same. In short, this distinction is meant to avoid confusion and conflation, not to establish a separation or bifurcation. At the terminological level, I think it would be proper to refer to what I have in mind by means of other labels such as appraisal, assessment, and judgment. I am reluctant to add the term “criticism” to this list of near-synonyms because I think criticism tends to have a negative connotation, in the sense of negative evaluation; nevertheless, to the extent that this connotation can be avoided, I would have no objection to speaking also of criticism.¹

My distinction between negative and positive evaluation is meant to refer to the difference between good and bad arguments, or right and wrong, correct and incorrect, sound and unsound, valid and invalid, logical and illogical, convincing and unconvincing, plausible and implausible, erroneous and not, fallacious and not, and the like. One could also speak of the difference between favorable and unfavorable evaluation, approving and disapproving, appreciative and depreciative, or constructive and destructive. Of course, at a subsequent and more refined level of analysis one may want to explore the differences among all the pairs just mentioned. I do not mean to pre-empt the possibility of such refinements; all I am saying is that they do not significantly affect the issue I am concerned with here.

Similarly, I do not mean to deny the propriety of discussing whether the evaluation of arguments is a viable and feasible activity.² To be sure, I am inclined to think that the anti-evaluation stance is ultimately untenable, partly because it is itself the evaluative expression of a thesis about evaluative arguments, and partly because I am too realistically and empirically minded to be blind to the fact that arguments are getting evaluated all the time. However, for the purpose of the present discussion I am simply taking for granted that there is such a thing as the evaluation of arguments and that many examples exist. On this assumption, I then want to explore the nature of the difference between two types of evaluative verdicts.

One other preliminary clarification is in order. Much of what claims to be, or is often taken to be, evaluation of arguments is really evaluation of individual claims, theses, beliefs, theories, hypotheses, and the like. Here, my point is that I want to be strict and literal, so that by the evaluation of an argument I do not mean simply the evaluation of a claim, but rather the evaluation of a claim together with the supporting

¹ For a discussion of some non-negative aspects of “criticism,” see Bailin (1988); cf. Finocchiaro (1989b; 1990).

² For some insightful discussions of this cluster of issues, see Willard (1983).

reasons or justifying premises. This point is worth stressing despite the fact that one type of evaluation of a claim would consist of examining whether it is justified, and to do the latter one would have to evaluate actual or potential justifications of the claim, namely arguments; the reason is that I want to deal with the evaluation of arguments directly and explicitly, not indirectly and implicitly. In other words, in evaluating an argument favorably, scholars and laymen often advance some other argument in support of the conclusion of the original argument; and analogously, in evaluating an argument unfavorably, they often give a refutation of the original conclusion, namely a counterargument, namely another argument whose conclusion is a denial of the original conclusion. The study of the evaluation of individual claims is certainly instructive in itself and would have to be part of a general theory of evaluation; and it is relevant to the present problem because there are important relationships between the evaluation of arguments and the evaluation of the conclusions of arguments. But, again, relationships ought not to be turned into confusing conflation, any more than distinctions should become bifurcating separations.

Finally, one last distinction will allow us to go to the heart of the problem, and not merely enable us to clarify a different aspect of the matter. The evaluation of arguments may be conceived as involving two main things: an evaluative claim about some argument, and the articulation of the rationale for the evaluative claim, namely a metalevel argument about the original argument. Now, we could not go very far in understanding the nature of the evaluation of arguments without understanding how one justifies such evaluations. In other words, we need to study the logic (and epistemology) of a special class of arguments, namely evaluative arguments, and in particular evaluative arguments about arguments; and the question we want to examine is whether these meta-arguments exhibit a significant difference when their conclusions express favorable verdicts from when they express unfavorable verdicts.

3. Formal Validation versus Formal Invalidation

In what follows I focus on a special case of the general problem which has been discussed by Gerald Massey and his critics.³ Their concern has been with evaluation from the point of view of formal logic, namely with assessing the formal validity or the formal invalidity of an argument; thus, as suggested above, one could speak here of the formal validation and the formal invalidation of arguments. Massey has elaborated the thesis that, whereas formal logic does provide techniques for proving arguments formally valid, it does not provide any techniques for proving arguments formally invalid; and he has argued that, therefore, there is a fundamental asymmetry between

³ Massey (1970, pp. 93-94; 1975a; 1975b; 1976; 1980; 1981a; 1981b; 1987); Bencivenga (1979); George (1983); and McKay (1984, 1987). Other noteworthy critiques of Massey are Govier (1987, chapter 9), Johnson (1989), Krabbe (1995), and Woods (1989; 1995); these critiques raise important issues and are incisive, but their focus is different from the present one, or else they appeared while this paper was in press and could not be taken into account in a substantive manner.

formal validation and formal invalidation, the asymmetry being that the former is feasible, but the latter is not. Using argument-theoretical language, and echoing the title of one of Massey's papers, one might say that he has tried to show that, while it is possible to give good arguments that good arguments are good, it is not possible to give good arguments that bad arguments are bad.

Massey himself has occasionally presented this thesis as a direct attack on informal logic. However, the conception of informal logic presupposed in that polemic is the one which equates the field with the study of fallacy in general, and of so-called informal fallacies in particular. Now, whatever justification there may have been in the past for such a conception, the field has lately advanced much beyond that,⁴ and so we need not say anything more about that aspect of the polemic.

Massey's primary objective has really been to exploit the asymmetry in order to motivate and justify his own program for a philosophical linguistics which would simultaneously unify logic and grammar and provide what could plausibly be called a "natural logic";⁵ this program is meant to provide principles for the analysis of the formal structure of argumentation in natural language, and such that formal validity and formal invalidity would be consequences of grammatical-logical well-formedness and the failure of well-formedness. Despite the attractiveness of this empirical bent and of this emphasis on natural language argumentation, the formalism of the program is so ambitious that I feel no inclination to discuss further this alleged consequence of the alleged asymmetry.

At any rate, the asymmetry has been criticized from both directions. That is, Ermanno Bencivenga (1979) has objected that the formal validation of arguments is as questionable as their formal invalidation, and Thomas McKay (1984, 1987) has objected that the formal invalidation of arguments is not as hopeless and arbitrary as Massey makes it sound. In the one case, formal validation and invalidation are equally unfeasible, strictly speaking; in the other case, they are equally feasible, loosely speaking. But in both cases they stand on an equal plane, and the asymmetry disappears.

Massey himself has recently credited to someone else the discovery of the asymmetry thesis, that is, to the lead paper in the October 1967 issue of *Mind*, by American philosopher James W. Oliver (1967). Therefore, Oliver's contribution should also be taken into account.

As suggested above, the problem of formal validation versus formal invalidation is an important one, and now I can also suggest some reasons for this importance. First, my resolution of this problem will lead to an appreciation of some of the limitations of formal logic, and these point in the direction of informal logic. Moreover, this type of asymmetry seems to be a special case of a general phenomenon or cluster of prob-

⁴ See, for example, Doss (1985), Finocchiaro (1980; 1984), Freeman (1994), and Johnson and Blair (1985). See also the criticism in Johnson (1989).

⁵ Massey (1975a, pp. 74-76) regards this as being partly in the tradition of Lakoff (1970).

lems which have been studied from many quarters and which cannot be easily dismissed.⁶ Finally, it should also be kept in mind that the literature on formal validation versus invalidation has *prima facie* an added, self-referential relevance insofar as it constitutes for us something of a case study of the problem: we have Oliver's original argument; then Massey's argument could be regarded as a positive evaluation of that original argument; on the other hand, the objections by Massey's critics (Bencivenga, McKay, and George) could be regarded as negative evaluations of Oliver's argument.

4. Oliver on Showing Invalidity

Let us now focus on Oliver's argument since, as Massey (1987) himself has pointed out, it antedates Massey's account by about a decade. Oliver's main conclusion is that there is one and only one rigorously correct method of showing that an argument is formally invalid: it is to show that its premises are true and that its conclusion is false. This claim has two parts: one negative, the other positive. The positive part asserts that

- (1) showing that the premises are true and the conclusion false is a rigorously correct method of showing that the argument is formally invalid.

The negative part asserts that

- (2) there is no other rigorously correct method of showing that an argument is formally invalid.

⁶ For more details on this, see Finocchiaro (1980, pp. 332-41; 1981, pp. 17-18; 1988, pp. 28-29, 121-22, 141, and 245-48; and 1992). Here one should add two other apparent asymmetries which emerged in discussions at the Third International Symposium on Informal Logic, University of Windsor, Canada, 15-18 June 1989, where parts of this paper were first presented. One was hinted at in the panel discussion on legal reasoning, and it involves situations where considerations of the burden of proof are important; it seems that in Anglo-Saxon jurisprudence guilty verdicts must be proved more stringently than innocent verdicts, that is, legal proofs of guilt are more easily criticizable than legal proofs of innocence. Another type of asymmetry was mentioned by Michael Scriven (1989) in his plenary lecture, and it involves a significant difference between the negative evaluation and the positive evaluation of at least products. He pointed out that there is an important class of evaluation situations where the identification of a particular flaw is sufficient to justify the rejection of the product (for example, demonstrably unsafe brakes in an automobile), whereas the product can be deemed acceptable only when it possesses a whole list of necessary qualities; this suggests that negative evaluative conclusions are easier to justify than positive ones; or, in argument-theoretical terminology, we might say that good arguments with negative evaluations as conclusions are easier to construct than arguments with positive evaluative conclusions. This type of asymmetry certainly deserves further study, partly to determine its exact nature, and partly to determine its exact relationship to the others. For example, its direction seems to run counter to that of some of the other asymmetries because here the justification of negative evaluations seems easier than the justification of positive ones, whereas the asymmetry suggested above seemed to involve the reverse. Moreover, in his lecture Scriven himself discussed the case of what he called evaluative arguments whose inferential soundness is not affected by the falsity of some premises; in these cases no one quality can outweigh the cumulative effect of all the others, and therefore even the present type of asymmetry does not seem to apply.

Oliver's argument in support of the positive part of his thesis is brief and uncontroversial. It is based primarily on the following definition of formal validity:

- (1.1) a formally valid argument is one which instantiates a valid argument form; and
- (1.2) a valid argument form is an argument form which has no counterexamples; where
- (1.3) a counterexample to a given argument form is an argument which instantiates that form and has true premises and false conclusion.

The rest of the argument would be the following: whatever forms the given argument instantiates, none of those forms are valid because they all have a counterexample, namely the given argument in question.

These definitions and this argument are only a slightly more pedantic manner of saying the following: a formally valid argument is one such that it is impossible for its premises to be true and its conclusion false; now if the given argument has true premises and false conclusion, then it is obviously possible for its premises to be true and its conclusion false. QED.

Oliver's argument in support of the negative part of his thesis (2) is more roundabout, and ultimately can at best be only inductively correct since it depends on an empirical or imaginary examination of various methods together with a disqualification of each as not being rigorously correct. His examination consists of three types of considerations:

- (2.1) no method is rigorously correct if it depends on the false principle that (2.11) a formally invalid argument is one which instantiates an invalid argument form;
- (2.2) all apparently rigorous methods, such as truth tables, syllogistic rules, and Venn diagrams, are methods for showing the invalidity (or validity) of various argument forms rather than of arguments;
- (2.3) if one examines the textbooks, none of the methods one finds are in fact rigorously correct: they either use the false principle (2.11) just mentioned, or they equivocate between arguments and argument forms.

Let us focus on this principle (2.11) that a formally invalid argument is one which instantiates an invalid argument form, for which we may adopt the elegant label of "pseudo-principle of illogical form" given to it by Massey (1987). Now, as Oliver points out, the first thing to understand about this principle is that, although it looks equivalent to the definition of formal validity, it really is not. That is, it looks like one can obtain this principle by starting with the definition and replacing the term "valid" by the term "invalid." The two principles are indeed isomorphic transformations of each other, with the terms "valid" and "invalid" interchanged. However, such a transformation is itself invalid. In particular, the invalidity pseudo-principle does not follow validly from the definitional principle of validity. In other words, the following meta-argument is not formally valid:

- (3) a formally valid argument is one which instantiates a valid argument form,
 (4) so, a formally invalid argument is one which instantiates an invalid argument form.

Whatever plausibility this argument has, it stems from the fact that it appears to instantiate an argument form such that the premise is a biconditional and the conclusion is another biconditional whose two components are denials of the components of the former. That is, the premise may be interpreted as the biconditional that

- (3.1) an argument is valid iff it instantiates a valid argument form;
 and the conclusion may be interpreted as the biconditional that
 (4.1) an argument is invalid iff it instantiates an invalid argument form.

And then it looks as if the transition from the premise to the conclusion instantiates the form:

- (3.2) $p \text{ iff } q$, so (4.2) $\text{not-}p \text{ iff not-}q$,

or at least the form:

- (3.3) $(x)(Fx \text{ iff } Gx)$, so (4.3) $(x)(\text{-}Fx \text{ iff -}Gx)$.

However, such instantiations do not work out. For example, if “ Gx ” symbolizes the expression “ x instantiates a valid form” then “ $\text{-}Gx$ ” would symbolize the expression “ x does not instantiate a valid form,” and the latter is by no means synonymous with the expression “ x instantiates an invalid form.” The difference between these two expressions is that the first means that there is no valid form instantiated by x , whereas the latter means that there is an invalid form instantiated by x . Now, going back to the argument in question, what this shows is that it does not instantiate either one of the two valid forms mentioned. But this does not prove its invalidity, since to do this one would have to show that the argument does not instantiate any valid form. What this analysis does do is to explain the semblance or appearance of validity.

At this point it would be natural to try to find a form which the argument does instantiate. The premise is an instance of the form:

- (3.4) $(x)\{\text{if } Ax \text{ then } [Vx \text{ iff } (Ey)(Fy \ \& \ Ixy \ \& \ Vy)]\}$,⁷

which may me read as:

⁷ Here and elsewhere in this paper, the existential quantifier is symbolized by the letter ‘E’ rather than the more usual “backward-E”.

- (3.5) an argument is formally valid iff there is some argument form such that the argument instantiates it and this form is valid.

And the conclusion instantiates the form:

- (4.4) $(x)\{\text{if } Ax \text{ then } [-Vx \text{ iff } (Ey)(Fy \ \& \ Ixy \ \& \ -Vx)]\}$,

which may be read as:

- (4.5) an argument is not formally valid iff there is some argument form such that the argument instantiates it and this form is not valid.

Now, this meta-argument form is itself invalid, but to conclude from the invalidity of this form that the original argument is invalid would be to commit the error which Oliver is trying to expose.

Therefore, he resorts to what he regards as the only correct method of proving invalidity, mentioned above. He first points out that the premise is true by definition, and then he refutes the conclusion by giving some counterinstances, that is, instances of arguments which instantiate invalid forms but are valid. One of these is the following instance of affirming the consequent:

- (5) “If something is red, everything is red.
Everything is red.
Therefore, something is red” (Oliver, 1967, p. 463).

In regard to the apparently rigorous methods of proving invalidity, for the cases of truth tables and Venn Diagrams, it is obvious that they refer to argument forms and not to arguments, and that therefore the gap remains between the invalidity of the forms and the invalidity of the original natural language arguments. The case of the syllogistic rules is not so obvious. Oliver’s argument here is that there are many syllogisms which instantiate invalid forms but are valid. Consider for example:

- (6) “Some men are non-self-identical.
Some Parisians are non-self-identical.
Therefore, no Parisians are men” (Oliver, 1967, p. 471).

This instantiates the syllogistic form:

- (7) some A are B; some C are B; so, no C are A,

which violates all the main rules of the syllogistic theory. Yet the original argument is formally valid because the premises are both logically false. Or consider the argument:

- (8) “Nothing that is blue or not blue is square.
 Nothing that is red or not red is square.
 Therefore, something that is red or not red is blue or not blue”
 (Oliver, 1967, p. 472).

This syllogism instantiates the form:

- (9) no A is B; no C is B; so, some C is A,

which is obviously invalid and violates several rules. Yet the original argument is formally valid because the conclusion is logically true.

5. Massey’s Asymmetry Thesis

Although in his latest paper on the topic Massey (1987) has credited Oliver with having anticipated the asymmetry thesis, Oliver does not in fact speak of asymmetry. Indeed, he says almost nothing about methods for proving validity, and so he is making no comparison and contrast on the basis of which he might have inferred an asymmetry. This contrast and this inference were Massey’s own contributions in his *earlier* papers on the topic.⁸ Working at that time independently of Oliver, Massey did three main things. He explained how the definition of formal validity yields a viable method for proving that arguments are valid: this is the familiar technique of finding a form which the argument may be said to instantiate and which is valid. He strengthened Oliver’s conclusion that there is one and only method of proving formal invalidity, namely the combined verification of premises and falsification of conclusion, which Massey (1975a, p. 64) labels “the trivial logic-indifferent method.”⁹ And then on the basis of these two theses he explicitly drew the conclusion that there is a fundamental asymmetry between formal validation and invalidation.

Massey’s strengthening of the point about the difficulties with formal invalidation is as follows. As we have already seen, the basic definition of formal validity is essentially a biconditional one side of which states that

- (10) if an argument instantiates a valid argument form, then it is formally valid;

⁸ I emphasize *earlier* because in his latest paper on the topic, Massey (1987) seems to abandon the asymmetry thesis and to focus on the indeterminacy of translation, which he claims applies to both formal validity and formal invalidity; however, he claims (1987, p. 6) that the indeterminacy of translation applies asymmetrically to the cases of validity and invalidity, and so a new version of his asymmetry thesis emerges. The examination of this new alleged asymmetry is beyond the scope of this paper.

⁹ Massey also provided the following more elegant counterexample to the pseudo-principle of formal invalidity: “If something has been created by God, then everything has been created by God. Everything has been created by God. [Therefore,] Something has been created by God” (1981a, p. 492).

the other side may be stated as saying that

- (11) if an argument does not instantiate a valid argument form, then it is formally invalid.

The latter principle could be regarded as providing a method of showing invalidity by showing that the argument fails to instantiate a valid form.

The essential difficulty with this latter principle is that the class of valid argument forms is not closed; that is, we cannot provide a complete list of all valid argument forms. Formal logic is an open-ended science, and formal logicians are constantly adding to the known list of valid argument forms. This is illustrated even in the pedagogy of formal logic, which usually proceeds from truth functions, to monadic predicates, to relational predicates, to identity theory, and so on. Thus, if a valid syllogism is symbolized merely with the resources of the truth-functional calculus, it will fail to instantiate any valid form, but that will not render it invalid, but merely *truth-functionally* invalid. Similarly, if a valid argument whose validity depends on identity is analyzed with the resources of predicate calculus without identity, it will fail to instantiate a valid form, but that will not render it invalid.

Further, in the context of logical theorizing, Massey gives two interesting examples. Consider the argument:

- (12) John took a walk by the river; so, John took a walk.¹⁰

This argument is indeed intuitively valid, and could even be shown to be valid with the help of some meaning postulates. However, its *formal* validity was in question until Davidson (1968) devised an argument form which this argument instantiates. Now, if the above principle had been taken to refer to known logical forms, before Davidson's analysis it would have declared this argument invalid. Similar remarks apply to an argument first shown valid by Leonard and Goodman (1940) by devising a calculus of individuals to enrich ordinary predicate calculus. The argument is:

- (13) Tom, Dick, and Harry are partners; so, Tom and Harry are partners.¹¹

Here the essential point is that, just because one has not found a valid argument form, one cannot be certain that someone else will not find it, or that someone else will not invent some new logical system which will allow us to devise an appropriate form.

¹⁰ Massey (1981a, p. 495); cf. Massey (1987, pp. 7-8) and Davidson (1968).

¹¹ Massey (1981a, p. 495); cf. Massey (1976), and Leonard and Goodman (1940).

6. The Formal Validation of Arguments

Criticism of the Oliver-Massey thesis has tried to show that on the one hand formal validation is not as rigorous as they make it sound, and that on the other hand formal invalidation is more rigorous than they make it sound.¹² Let us begin with formal validation.

One criticism is that the formal validation of an argument depends on the existence of valid argument forms, but the validation of the latter is a less rigorous affair than it may seem.¹³ Recall that to say that an argument form is valid is to say that it has no counterexamples. Now, although finding even one counterexample will invalidate the form, not finding it may be due to lack of ingenuity. Of course, one will have a validation if one finds a proof in a consistent and sound logical system, but many logical systems (including relational predicate calculus) are not decidable, and so finding a proof is not a mechanical task. In other words, in special cases of decidable logical systems like the truth-functional calculus, the validation of an argument form is a mechanical procedure; but in general, since many logical systems are undecidable, the validation will depend on the construction of a proof in a sound and consistent system. Such a construction will provide a rigorous validation, but finding it is not a rigorous process.

The plausibility of Massey's thesis about formal validation derives partly from the simplicity and triviality of his examples. One of these involves an argument of the form "P & Q; so, Q,"¹⁴ another the form "all A are B; x is A; so x is B."¹⁵ The issue could have been much more difficult if we were dealing with a form like the following:

- (14) $\neg(\exists x)(\exists y)(Fx \ \& \ Gy \ \& \ Hxy);$
 $(x)([\text{if } Fx \text{ then } (\exists y)(Fy \ \& \ Hxy)]);$
 $(x)(y)(\text{if } Hxy \text{ then } Hyx);$
 so, $\neg(\exists x)(Fx \ \& \ Gx).$ ¹⁶

¹² This useful classification is due to Massey himself (1987). There is also the criticism of George (1983), objecting that Massey presupposes an untenable concept of argument, as well as the critiques in Johnson (1989), Govier (1987, chapter 9), Krabbe (1995), and Woods (1989; 1995), which raise other issues or are too recent to take into account in this paper.

¹³ This point is similar to one made by Bencivenga (1979, pp. 249-50).

¹⁴ Cf. Massey (1975a, p. 63).

¹⁵ Cf. Massey (1975a, pp. 64-65).

¹⁶ See Kalish, Montague, & Mar (1980, pp. 249, 261), where this form is instantiated by the argument: no teacher is married to a student; every teacher is married to a teacher; marriage is a symmetrical relationship; so, no teacher is a student.

Another criticism of the above-mentioned thesis about the formal validation of arguments involves a fact admitted by Massey himself (1980, p. 321), and exploited by him for other purposes. That is, the validation of *arguments* involves linguistic intuitions to the effect that certain statements are synonymous with certain others. This applies even to the trivial example referred to in the previous paragraph. The original argument was:

(15) Sam and Sue are doctors; therefore, Sue is a doctor.¹⁷

Here the premise must be intuited to be synonymous with the statement that “Sam is a doctor and Sue is a doctor”; only then can we regard it as an instance of the conjunction “P & Q.” The crucial importance of linguistic intuition is clearly and vividly shown by another example given by Massey where the same translation would be wrong: “Tom and Dick weigh 200 kilograms” (1980, p. 320). This obviously does not mean that Tom weighs 200 kilograms and Dick weighs 200 kilograms.

7. The Formal Invalidation of Arguments

Let us now consider some criticism of the Oliver-Massey thesis about formal invalidity. As mentioned before, this criticism tries to show that formal invalidity can be justified without reliance on the nonsequiturs and equivocations they are bent on exposing.

It will be useful to focus on the argument we examined earlier, which goes from the definition of formal validity to the pseudo-principle of illogical form. The meta-argument was as follows:

(16) an argument is formally valid iff it instantiates a valid argument form;
so, an argument is formally invalid iff it instantiates an invalid argument form.

Earlier, following Oliver, we invalidated this argument by pointing out that the premise is true and the conclusion is false. Moreover, it certainly would be formally invalid to argue that this argument is invalid *simply because* it instantiates the following invalid form:

(17) $(x)\{\text{if } Ax \text{ then } [Vx \text{ iff } (Ey)(Fy \ \& \ Ixy \ \& \ Vy)]\}$
so, $(x)\{\text{if } Ax \text{ then } [-Vx \text{ iff } (Ey)(Fy \ \& \ Ixy \ \& \ -Vy)]\}$.

However, as Thomas McKay has argued, “instancehood” is not their only relationship, for we can also show that the form “represents all details likely to be relevant to the validity of the argument” (McKay, 1984, p. 99). Notice that this is something that would not be true if we were to interpret a valid syllogism by the mere resources of the sentential calculus, which would yield the argument form:

¹⁷ Cf. Massey (1975a, p. 63).

(18) P; Q; so, R.

Notice also that this is a form also instantiated by every argument with two premises and one conclusion. Similarly, recall that earlier we mentioned an argument which is valid even though it instantiates the form of affirming the consequent; that form did not represent all relevant logical details.

Therefore, the pseudo-principle of illogical form should be modified to read:

(19) an argument is formally invalid iff it instantiates an invalid argument form *and* this form “represents all details likely to be relevant to the validity of the argument.”¹⁸

Now, this modified rule of formal invalidity is not as neat as the pseudo-principle, and its satisfaction is both a matter of degree and subject to revision. However, all that this means is that the formal invalidation of an argument is an empirical, pragmatic, or informal business.¹⁹ It remains true that by using such a rule arguments cannot be formally invalidated by means of formally valid meta-arguments, but it is equally true that their formal invalidation *can* be justified. We might add that this difficulty with this part of the Oliver-Massey thesis is that they were restricting themselves to what might be called deductive arguments, in a situation where all we can ever hope for is inductive arguments.

A second criticism would involve a reappraisal of what is called the “method of counterexample” by some (Salmon 1984, p. 21) and the technique of “refutation by logical analogy” by others.²⁰ This is the technique of invalidating an argument by formulating another argument with the same logical form as the first and with obviously true premises and obviously false conclusion. Oliver (1967, pp. 469-70) explicitly criticizes this technique by interpreting it as being identical to the technique of using the pseudo-principle of illogical form. I suppose he is thinking that to say that two arguments have the same form is to say that the two arguments instantiate the same form. On this interpretation, his criticism would indeed follow.²¹

¹⁸ Again, the quoted clause is from McKay (1984, p. 99).

¹⁹ Bencivenga (1979) also reaches conclusions that point in a pragmatic and empirical direction.

²⁰ Copi (1986a, pp. 187-90; 1986b, pp. 289-91); Govier (1985); and Oliver (1967, p. 469). McKay (1987) also discusses this same technique, although without using the label. Since writing these words, I have been convinced by Krabbe (1995) that the method of logical analogy should be distinguished from the method of counterexample, although, as Krabbe also clarifies, the latter should also be distinguished from the formal method of countermodel; his important paper deserves careful study.

²¹ Oliver’s interpretation was perhaps partially justified since the target of his criticism seemed to be Copi, who does indeed have that in mind. In fact, although Oliver (1967, p. 469) deliberately omits a specific bibliographical reference for the quotation he is criticizing, and although he must have been using an earlier edition of Copi’s book, even the seventh edition of the latter reads almost exactly like Oliver’s quotation; cf. Copi (1986b, p. 289).

However, this technique ought to be interpreted as a way of bypassing the problem of having to deal with a logical form to attribute to the arguments in question and to be instantiated by them. The really important thing would be the counterexample, which is another actual argument. Talking of the same form of two arguments thus would be a way of saying that they are formally isomorphic or analogous, that is, that there is a one-to-one correspondence between various elements of the two arguments; it would not be a way of saying that each of the two arguments has some unique logical form and that the logical form of each is identical.²²

Let us apply the technique to the same meta-argument discussed above. When presented with this argument, one could respond that it is no more valid than the following argument, which is obviously invalid:

- (20) a person is a doctor iff he has received a doctoral degree;
so, a person is a nondoctor iff he has received a nondoctoral degree.²³

This argument is obviously invalid because its premise is obviously true, whereas its conclusion is obviously false: a nondoctor is a person who has not received *any* doctoral degrees, whereas doctors usually receive other nondoctoral degrees before their doctoral one.

Now, let us ask why they could be said to have the same logical form. Clearly it would be incorrect to say that the original argument (16) and the counterexample (20) have the same logical form because they instantiate the same argument form; we have already seen that, for example, all syllogisms may be said to instantiate the form “P, Q, so R,” but this does not even begin to give them the same form. Equally obviously, it would be correct to say that these two arguments have the same form because they instantiate the same argument form (17) *and* this form represents all the details likely to be relevant to their validity; however, this type of consideration would merely repeat

²² The move I am suggesting is analogous to Quine’s move about meaning and sameness of meaning: the latter need not presuppose the existence of mysterious entities called meanings which words have, but may be conceived as a relationship of pairs of linguistic expressions, which may be labeled synonymy; see Quine (1961, pp. 11-12, 22, and 48). I also think that my move is practically identical to the one suggested by George (1983), although I am not sure because his argument is unnecessarily complicated. Working in the context of Bolzano’s logical theory, George argues that for Bolzano the form of an argument is a set of arguments generable from it, and that this avoids Massey’s asymmetry because “the fact that invalid forms can have valid arguments as elements is a matter of no significance, since the only form we look to in assessing validity or invalidity is that generated from the argument itself” (George, 1983, p. 321). Moreover George criticizes Massey by arguing that his examples are not well-formed arguments, since there is more to defining an argument than specifying a <{premise}, conclusion> pair, namely a third element amounting to “understanding what the argument is”; in short, Massey’s examples are examples of ambiguous arguments from the point of view of Bolzano’s theory. It should be mentioned that Massey (1987) takes George’s criticism into account and ends up partially agreeing with him.

²³ Another example would be: a homeowner is a person who owns a home; so a nonhomeowner is a person who owns something which is not a home.

the point made earlier, when we modified the pseudo-principle of illogical form into a workable rule for formal invalidity.

If we want to make a different point, perhaps we could say something like the following. In each of the two arguments one is moving from a biconditional premise to a biconditional conclusion, and in the process a particular term which appears in both clauses of the premise is replaced by a contradictory term in both clauses.

Let us see why this sort of consideration would not apply for the case of the valid instance of affirming the consequent discussed earlier. Oliver's example was:

- (21) "If something is red, everything is red.
Everything is red.
Therefore, something is red" (Oliver, 1967, p. 463).

Suppose we tried to invalidate this argument by advancing the following alleged counterexample:

- (22) if Ronald Reagan lives in San Diego, then he lives in California;
Ronald Reagan lives in California;
so, Ronald Reagan lives in San Diego.

These two arguments have many similarities, but also one crucial difference: in the original argument the conclusion is a special case of the second premise, but this is not so in the alleged counterexample. We may conclude that in order to have the same form, two arguments must share *all* relevant structural details, and not just some.²⁴

More generally, we may say that two arguments have the same form iff whenever the first instantiates a given form so does the second and viceversa; that is, two arguments have the same form iff there is no argument form which one of them instantiates but the other does not. For example, in the two arguments just discussed, (21) and (22), the following form is instantiated by the first but not by the second:

- (23) if $(Ex)Rx$ then $(x)Rx$; $(x)Rx$; so, $(Ex)Rx$.

²⁴ Incidentally, one consequence of this would be that some instances of the same conditional argument forms would not really have the same form. For example, the following are traditionally regarded as having the same form because they both instantiate modus tollens: (A) if Richard Nixon lives in Florida then he lives on the East Coast; Richard Nixon does not live on the East Coast; so, Richard Nixon does not live in Florida; (B) if Richard Nixon lives in Florida then he does not live in New York; Richard Nixon lives in New York; so, Richard Nixon does not live in Florida. In general, each of the four types of conditional propositional argument would have four subtypes, depending on the occurrence or nonoccurrence of negations in the antecedent or the consequent. This corresponds to the way such arguments are experienced at the psychological level, as experimental psychologists have demonstrated (Evans, 1972a, 1972b, 1982, 1983a, 1983b, 1983c).

Similar remarks would apply to the above mentioned valid syllogisms which instantiate invalid forms. For example, argument (8) could not be invalidated by advancing the following alleged counterexample:

- (24) no man is a woman;
 no inanimate object is a woman;
 so, some inanimate object is a man.

Both this argument and the earlier one (8) instantiate many forms, but the following is instantiated only by the earlier one (8) and not by this one:

- (25) no A or not-A is a B;
 no C or not-C is B;
 so, some C or not-C is A or not-A.

However, this is still too formalist.²⁵ I believe that ultimately we should take more seriously the suggestion implicit in the label which refers to analogy. That is, ultimately this method of invalidation should be conceived as analogical reasoning about arguments,²⁶ that is, as a meta-argument which concludes that the given argument is invalid because the counterexample argument is invalid and the two arguments are analogous. Then the alleged analogy could be discussed in the usual ways, by examining the extent and nature of the similarities and the dissimilarities between the two arguments. Here too we would have a type of inductive reasoning about deductive or formal arguments, or to be more exact, inductive reasoning about the formal and the deductive evaluation of arguments.

8. Conclusion

The analysis in the previous section shows that, although the formal invalidation of arguments is not an easy matter, it is a task which can be justified to a greater or lesser degree. This was also found to be the case for formal validation, though we arrived at such a conclusion by approaching from the other side, that is by criticizing the thesis that formal validations were generally susceptible of rigorous demonstration. Therefore,

²⁵ Further formalist developments could perhaps be articulated by adapting some of the ideas contained in Hitchcock (1994).

²⁶ I owe this idea in part to Govier (1985), who comes close to saying just this, and to Copi (1986a) who very suggestively includes the technique of refutation by logical analogy in the chapter on analogical reasoning.

the two processes seem to be more similar than dissimilar, and the asymmetry alleged by Oliver and Massey evaporates.²⁷

More importantly and more positively, we have seen that even the formal validation and invalidation of arguments involve what may be called informal argumentation. Formal validation depends on the determination of the validity of argument forms, which in turn depends on the discovery and invention of proofs, which is ultimately a process of informal argumentation; and formal validation also depends on the translation or interpretation of the original natural language sentences involved, which depends in turn on linguistic intuitions about the synonymy of various natural language sentences; and the latter is an inherently informal process of argumentation (*pace* Massey). Similarly, formal invalidation depends partly on the claim that a given argument form reflects all relevant logical details, which is best regarded as an inductive generalization; and formal invalidation also depends on the comparison between the argument in question and a proposed counterexample argument, and such comparison is best regarded as an instance of analogical reasoning, with all the advantages and the pitfalls pertaining thereto.

Further informal-logic and argumentation-theory implications stem from the case-study aspect of our investigation. That is, once one reconstructs Oliver's account as an argument trying to show the formal invalidity of justifications of typical invalidity-verdicts, Massey's own account becomes primarily a second argument using Oliver's main conclusion as a premise to arrive at the further conclusion of asymmetry, rather than a positive evaluation of Oliver's original argument accompanied by a supporting justification. Moreover, I presented two criticisms of the Oliver-Massey argument by adapting and adding to the objections raised by Bencivenga, McKay, and George; and these criticisms were negative evaluations of Oliver's main conclusion about formal invalidation and of Massey's conclusion about formal validation. Now, it is perhaps debatable whether or not these criticisms were directed at the arguments rather than at the conclusions, but it is clear that the negative evaluations were not simple invalidity-verdicts, if at all; for the criticisms were that the formal validation of arguments is a less formal affair than the Massey asymmetry thesis claims, and that the formal invalidation of arguments is a less hopeless affair than Oliver's thesis claims. All of this is, I believe, typical of philosophical argumentation, which goes to show that the latter is not significantly governed by formal-logical consideration even when the topic involves concepts of formal logic.

Of course, this general positive conclusion ought to come as no surprise to the argumentation theorist and informal logician; the most it may do is to give explicit articulation to their basic intuitions. However, from a pedagogical point of view, a perplexing problem emerges from our exercise of evaluating the Oliver-Massey argument. Given, as we have seen, that the actual arguments on which one bases

²⁷ Woods (1995) also argues for symmetry, but does so in a context somewhat different from the present one; his paper will deserve further serious reflection in the future.

verdicts of formal validity or invalidity are typically formally invalid, is it proper to pretend to teach students how to argue formally about the subject matter that makes up the usual examples of formal-logic textbooks? Would it not be better to begin arguing formally about such concepts as validity, invalidity, argument form, and the like? I believe this can be done only by completely mathematizing the subject and teaching formal logic purely as a branch of mathematics. But there is another way, which turns out to be another way to teach logic and argumentation. It is to teach about such concepts as formal validity and invalidity, argument form, and so on, by emphasizing the nonformal, informal, and inductive considerations discussed above. To do this would be to teach the informal logic of formal logic,²⁸ as it were; to teach informal logic by using formal logic as substantive content. But then the question arises whether or in what contexts such a substantive content is appropriate. How does it compare with current events, advertising copy, newspaper editorials and reports, and magazine articles?²⁹ How does it compare with the arguments contained in classic texts in the history of thought?³⁰ These are not meant to be merely “rhetorical” questions, but their resolution is beyond the scope of this paper.³¹

²⁸ This idea may be taken as an inversion of, or complement to, the idea of “the necessity of formalization in informal logic” (Woods 1989); on this issue, cf. also Freeman (1994) and MacPherson (1995). However, my idea is in accordance with a project in which I have also explored the informal logic of science (Finocchiaro 1988a), and it stems from my belief that it is generally instructive to explore those aspects of a given phenomenon which seem to be antithetical to the way it appears on the surface (see Finocchiaro 1988b).

²⁹ In regard to this material (favored in recent elementary informal-logic textbooks), I am inclined to share the reservations expressed by Woods (1989).

³⁰ This is the material I would tend to favor, in regard to which see Finocchiaro (1987; 1989a; 1991; 1993; and 1994); it also corresponds to the trend exemplified in Fisher (1988), Fogelin (1987), and Garver (1985).

³¹ A shorter version of this paper was presented at the Third International Symposium on Informal Logic, University of Windsor, Windsor, Ontario, Canada, June 1989. Another version, largely equivalent to the present one, was published in a volume stemming from that symposium (Johnson and Blair 1994).

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