

Toulmin's Analytic Validity

Validez analítica en Toulmin

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Abstract: Although Toulmin says several things that are plainly false, I hope to show in this paper that Toulmin's conception of analytic arguments is not as incoherent as some have supposed and does in fact classify a theoretically significant class of arguments. However, analytic validity turns out to be not much different from semantic validity. Since the distinction between formal validity and semantic validity is well recognized by logicians, the charge made by Toulmin that they could not accept the distinction between formal validity and analytic validity is confounded. This eliminates one major plank in the case he builds against the analytic ideal. Thus, I want to defend Toulmin's conception but reject the moral he draws from it.

Keywords: Toulmin, logic, analytic arguments, formal validity, analytic validity.

Resumen: Aunque Toulmin dice varias cosas que son directamente falsas, espero mostrar en este trabajo que la concepción de Toulmin de argumentos analíticos no es incoherente como algunos han supuesto y que de hecho clasifica una clase teóricamente significativa de argumentos. Sin embargo, la validez analítica tiende a ser no muy diferente de la validez semántica. Dado que la distinción entre validez formal y validez semántica está bien señalada por los lógicos, el alegato hecho por Toulmin de que no se podría aceptar la distinción entre validez formal y validez analítica está confundida. Esto elimina uno de los grandes hitos en la empresa que él construye en contra el ideal analítico. De modo que me gustaría defender la concepción de Toulmin, pero rechazando la moraleja que él obtiene de ella.

Palabras clave: Toulmin, lógica, argumentos analíticos, validez formal, validez analítica.

1. Introduction

The distinction between analytic and substantial arguments is described by Toulmin (1958, p. 138) as the most “fundamental”. In this paper I will be saying very little about substantial arguments or substantial validity. I will be focussing on what I take to be the most interesting and important part of Toulmin’s discussion, namely the claim that there can be analytic arguments with only probable conclusions. The importance of this is that if there are such arguments, then Toulmin sees this as a problem for formal logicians, because they take analytic arguments and necessary arguments to be co-extensive (and consequently analytic arguments and probable arguments to be mutually exclusive). It will be shown later how this is just one part of a wider strategy aimed at discrediting formal logic and what Toulmin calls the “analytic ideal.” It will also be shown that other aspects of this wider strategy fail, often for quite trivial reasons. This emphasizes the importance of whether this class of analytic probable arguments exists, for in the end, most of Toulmin’s case hangs on it. I will argue that it does exist, but that formal logic effectively already deals with it through the distinction between formal and semantic validity. Thus, although I do not pretend to be offering a comprehensive refutation of Toulmin’s attack, I intend to dismantle a major part of it and show that it is Toulmin, and not the formal logicians, who is confused.

Formal logicians, then, claim that analytic arguments and probable arguments are mutually exclusive, and so there are no analytic probable arguments by definition. If Toulmin can show that there are such things, then such would be counter-examples to the logician’s claim and definitions. There is one immediate objection to proposing analytic arguments with only probable conclusions as counter-examples that we must deal with from the start. Toulmin’s necessary/probable distinction is quite different to the logician’s necessary/probable distinction. The formal logician makes the distinction on the grounds of the relation between the premises and the conclusion, while Toulmin makes it on the grounds of whether there is a “probably” (or something similar) in the conclusion. The two classes that formal logicians would claim to be co-extensive are arguments whose conclusions follow necessarily from their premises (necessary) with arguments whose conclusions have meanings that are somehow contained in the mea-

nings of the premises (analytic). They are neutral on how those conclusions (or premises, for that matter) themselves are qualified. For instance,

P
if P then probably Q
Therefore, probably Q

is, according to the formal logician, a perfectly necessary, analytic, and formally valid argument despite the occurrence of “probably” in the conclusion. It is necessary on the logician’s account of the necessary/probable distinction, but probable on Toulmin’s account. There is nothing in the fact that an argument can be “probable” in Toulmin’s sense of the word yet analytic to bother the logician or justify the accusation that formal logicians make a mistake of conflating necessity with analytic and/or with formal validity — on the logician’s own conception of necessary arguments, they *are* co-extensive with analytic and formally valid arguments, and showing that they are not co-extensive with *Toulmin’s* conception of necessary arguments proves nothing. A genuine counter-example would not be — as Toulmin supposes — an analytic argument with a probable conclusion, but an analytic argument whose conclusion does not follow necessarily from the premises.

One might think, then, that Toulmin is on a hiding to nothing from the start. However, there is a type of argument that seems to be probable on *both* ways of understanding the necessary/probable distinction: statistical syllogisms. The formal logician would not count these as necessary or analytic, on the logician’s own conception of necessity and analytic validity. However, Toulmin wants to argue that this is an unprincipled restriction on what we are prepared to call analytically valid: there are arguments that we really should say are analytically valid but are not necessary (or, for that matter, formally valid). In fact, it will turn out that they may even have false conclusions! If there really is such a class of arguments, there is a problem for the formal logician after all: the logician cannot count such arguments as analytic if being analytic is co-extensive with being necessary and thereby excludes being probable.

There are two ways that defenders of formal logic might choose to respond: a) deny the coherence of Toulmin’s conception of analytic arguments

so that there is no such class, or; b) concede its coherence but deny that it is a significant departure from what is already admitted within the bounds of logical theory. Though no friend to formal logicians, Hamby (2012) argues vigorously for the first of these, and despairs that what Toulmin has described as “most fundamental” has turned out to be incoherent. I will argue that Hamby’s arguments fail, and take the second, more difficult option of trying to show that although it is coherent, analytically valid statistical syllogisms are not the problem for formal logicians that Toulmin supposes. I aim to do this by showing that, when Toulmin’s tests for analyticity are worked out, what they detect amounts to arguments that can justifiably *be thought to be* semantically valid, even though not all of them actually *are* semantically valid. Since semantic validity is a well-known concept well-established in logical theory, the anti-logic moral drawn by Toulmin from this case does not follow.

I want now to put Toulmin’s counter-example into its wider context, for it is only one plank in a more comprehensive attack against what Toulmin calls the ‘analytic ideal’. Because Aristotle’s syllogisms are analytic, formal logicians have made analyticity a standard to which all arguments must conform or otherwise be judged invalid. But Toulmin urges that syllogisms are unrepresentative of valid arguments as a whole but are only a special case where analyticity, necessity, formal validity, being “warrant-using”, and being expressed in logical words all come together, and so it is wrong to take analyticity or anything else named here as criterial for validity:

[L]ogicians thereupon conflated our five distinctions into one single distinction, which they made the absolute and essential condition of logical salvation. Validity they would from now on concede only to arguments which passed all the five tests, and the analytic syllogism thereby became a paradigm to which all self-respecting arguments must conform.

This overall, conflated distinction had to be marked by some pair of terms, and a number of different pairs were used at one time or another: ‘deductive’, ‘conclusive’ and ‘demonstrative’ to mark the favoured class of arguments, ‘inductive’, ‘inconclusive’, ‘non-demonstrative’ for the remainder. . . [L]et us use a term which has been very commonly associated with this conflated distinction, namely ‘deductive’.¹ (Toulmin, 1958, p. 138)

¹ It should be noted that Toulmin identifies “deductive” with “deductively valid”.

In general, Toulmin claims, these are not co-extensive, and it is a conflation, brought about by generalizing from a biased sample, to take them as so. Thus, Toulmin intends to create problems for formal logicians by arguing that there can be valid arguments that are necessary but not formally valid, necessary but not warrant-using, etc. These will be counter-examples to the logician's taking necessary arguments to be co-extensive with formally valid arguments and with warrant-using arguments, to give just two of the possible permutations. In particular for our purposes, he argues that there are analytic arguments that are not necessary; the analytic/substantial distinction is not the same as the necessary/probable distinction.

One wonders whether Toulmin is really being fair to the formal logicians here. Logicians recognize at least two conceptions of validity: formal validity and semantic validity. These types of validity are backed by different definitions: the proof-theoretic definition (which says that an argument is valid if its conclusion can be derived from the premises by applying the rules of the logic) and the model-theoretic conception (which says that an argument is valid if it impossible for the premises to be true and the conclusion false). These two validities are not co-extensive: the set of formally valid arguments are a proper subset of the set of semantically valid arguments, that is to say, not all semantically valid arguments are formally valid and so they cannot be proved.² Now, there are arguments that are analytic but not necessary, says Toulmin, but if this boils down to saying that there are semantically valid arguments that are not formally valid, then Toulmin is plainly wrong to say that logicians neglect this distinction. At worst, the logician has to choose whether to call semantically valid arguments "necessary" or not. Often they do.

² This might be thought be in conflict with the completeness of classical logic, but it is not: what completeness says is that tautologies of the formal language are semantic entailments, and all of these are also logical entailments. There can be tautologies of natural language that are not tautologies of the formal language; e.g., "If this apple is red then it is coloured" is a tautology in natural language but its formal translation "If p then q " is not a tautology. Despite this, formal logicians often consider "This apple is green; therefore, it is coloured" as a semantically valid argument though not formally valid. Tarski (1936/2002), in fact, introduces the model-theoretic conception precisely because he thinks that the proof-theoretic conception is not adequate to these kinds of examples. It does not conflict with the completeness theorem, then, to say that semantic validity understood this way has a wider extension than formal validity. Every argument that is formally valid will, of course, be semantically valid.

The counter-example we are going to discuss is, then, one of several that Toulmin proposes. However, I want to argue now that it is the main one; by showing the weakness of the others, I wish to emphasize the importance of the main claim in this paper. Toulmin's case against logic is then shown to rest heavily on there being analytic but probable (in the logician's sense) arguments. If I am right, then although Toulmin is left with a coherent, and (dare I say) interesting conception of analytic validity, not only is his proposed counter-example not really a counter-example, but his case against formal logic collapses entirely.

Three of the distinctions can be dealt with easily: necessary/probable, formally valid/cannot hope to be formally valid,³ expressed in logical words/not so expressed. By the last distinction, what Toulmin seems to mean are arguments whose validity is explicable by reference to the meaning of the logical words alone,⁴ and those that are not so expressed, or in other words, those whose associated conditionals are tautologies of the formal language, and those that are not. Obviously, arguments whose validity is explicable in this way will be formally valid,⁵ and those whose validity

³ I think Toulmin is distinguishing here between types of *valid* argument. He describes as formally valid those arguments "set out in such a way that its conclusion can be obtained by appropriate shuffling of the terms in the data and warrant" (Toulmin, 1958, p.137). But what does he mean by "appropriate"? Some shufflings of terms will give clearly false conclusions (Bermejo-Luque, 2011, p. 92). But if it is valid arguments that Toulmin has in mind, the appropriateness will be defined by the rules of inference. It seems that Toulmin has the proof-theoretic conception of validity in mind here: an argument is valid if its conclusion can be derived from its premises by using rules of inference.

⁴ It is quite true that formally valid arguments depend on being able to distinguish "logical" words from "non-logical", and also true that it is not obvious how this is to be done. Again, Tarski (1936/2002) raised this problem twenty years earlier, so if this is what bothers Toulmin (though Toulmin never actually says so) he certainly cannot say that logicians neglect this distinction.

⁵ This may be hasty because there are some things that are expressed entirely in logical words, and are true, and yet we would not like to say are logically true. For example, $\exists x. \exists y. x \neq y$ says that there are at least two things in the universe of discourse. If we count identity as a logical word, then the expression's truth depends entirely on the meaning of the logical words since there simply *are* no non-logical words, which is to say that if the expression is false (i.e., there are less than two things), then it comes out as a logical falsehood, and if it is true (i.e., there are at least two things), then it comes out as a logical truth. But this, surely, is counter-intuitive. Since Toulmin never considers anything like this, I see no good reason for Toulmin to distinguish between arguments that are formally valid and arguments whose validity depends only on logical words or any justice in his charge that it would be a mistake to take them as co-extensive.

is not explicable in this way will not be formally valid. It is no error then, to take these two distinctions as co-extensive, and, in fact, this seems to be one case where Toulmin does not present a counter-example; he does not offer us a valid argument that is formally valid but whose validity is not explicable by reference to the meaning of the logical words alone, or one whose validity is explicable by reference to the meaning of the logical words alone but is not formally valid. The case rests, then, on whether there are arguments that are formally valid and/or expressed in logical words but not necessary. Of course, in Toulmin's sense of the necessary/probable distinction there can be; we saw earlier a formally valid argument whose conclusion was qualified as "probably." In the logician's own sense of the necessary/probable distinction there cannot be: necessary arguments (assuming for the moment we do not count semantically valid arguments as necessary), formally valid arguments, and arguments expressed in logical words are all co-extensive. Toulmin's only reason for accusing logicians of making a mistake in their regard is because he is using a completely different necessary/probable distinction.

The distinction between *warrant-using* and *warrant-establishing* arguments is more problematic, both because it is not clear what the distinction is, and it is not clear whether formal logicians would make it at all. Does Toulmin mean by a *warrant-establishing* argument one where the warrant is the conclusion or, using Toulmin's terminology, the *claim*? Or does he mean one where the warrant being established does in fact feature as the warrant and the acceptability of the argument is then taken to establish in some kind of retrodictive sense the acceptability of the warrant?

In the only example he gives – 'Jack has three sisters; the first has red hair, the second has red hair, the third has red hair; so all Jack's sisters have red hair' (Toulmin, 1958, p. 126) – the warrant being established does seem to be the claim "All Jack's sisters have red hair". It seems from this that what Toulmin has in mind is an inductive argument, while noting that in cases where the induction is a complete enumeration, the argument is also analytic and formally valid. This appears to be a counter-example to the identification of analytic arguments with warrant-using arguments.

But do logicians make any such identification? I get the feeling that Toulmin has been misled by the fact that logicians sometimes describe arguments as "deductive" on the grounds that they argue from the general

to the particular (which can be seen as the same as “warrant-using”) and “inductive” on the grounds that they argue from the general to the particular (which can be seen as the same as “warrant-establishing”). I cannot see any other reason for supposing that logicians make a distinction between warrant-using and warrant-establishing arguments at all — it makes no difference to them how an argument is used. Then, because “deductive” arguments have been identified with arguments that are analytic, formally valid, etc., an argument that is formally valid but warrant-establishing might appear to be a counter-example. But this is only because of an equivocation on the word “deductive”. If this is the explanation, Toulmin conflates one way of making the deductive/inductive distinction with another; it is no counter-example for an argument classified as “deductive” on one version of the distinction (e.g., because the conclusion follows necessarily from the premises) should be classified as “inductive” on another version of the distinction.⁶ Consequently, it is no counter-example for an argument that is, for example, necessary/formally valid/analytic (which is deductive on one version of the distinction) to be warrant-establishing (which is inductive in the other version of the distinction).

2. Analytically valid arguments

So far, Toulmin’s proposed counter-examples have come to nought, foundering on straightforward equivocations between different senses of “necessary” or different senses of “deductive”, and his case against the formal logicians hangs by a thread. That thread is the possibility of analytic arguments with probable conclusions. We have already seen that logicians would not describe an argument as probable just because it has a probable conclusion, and that a probable conclusion can follow deductively, and can be detached, just as much as a necessary conclusion can. However, Toulmin’s examples do not have this form but are statistical syllogisms whose conclusions cannot be detached. Can there be analytic statistical syllogisms? If this is the case then it might still be a problem for formal

⁶ There is a further discussion of the warrant-using/warrant-establishing distinction in Botting (n.d.).

logicians. Hamby (2012) argues that the tests for analyticity do not work and do not define a coherent conception of analytic validity, and if so, it hardly matters whether statistical syllogisms can pass them. I will argue that, although insufficient as stated, the tests can be made to work, and consequently that, since statistical syllogisms can pass these tests, there can be analytic statistical syllogisms, and so analytic arguments are not co-extensive with necessary or with formally valid arguments. They are, however, co-extensive with something that is intelligible within logical theory, namely arguments that we are justified in thinking to be semantically valid. Thus, this counter-example fails, and with it the whole case Toulmin has been building that formal logicians un-justifiedly conflate all the distinctions mentioned into one.

It was hinted above that analytic arguments might be something like semantically valid arguments. We will look at his tests for analyticity and see how far this may be the case.

All arguments, when put into the “Data; Warrant; so, Claim” form will be formally valid, but when put into the “Data; Backing; so, Claim” form, most will not be formally valid. However, some arguments seem to be formally valid whichever form is given. He gives as an example (Toulmin, 1958, p. 115):

Anne is one of Jack's sisters	Data
All Jack's sisters have red hair	Warrant
So, Anne has red hair	Claim

is formally valid and trivially so; what makes it analytic is that

Anne is one of Jack's sisters	Data
Each one of Jack's sisters have (has been checked individually to have) red hair	Backing
So, Anne has red hair	Claim

is also formally valid, since Anne is one of the sisters whose hair colour is checked in the backing. Expanding the backing to refer to each of Jack's sisters individually makes the argument into a *petitio principii* — a formally valid, albeit circular, argument.

Hamby (2012, pp. 121-22) denies that the second of these arguments is formally valid. What is in the parenthesis is fundamentally part of the argument, Hamby urges, so the conclusion should be “So, Anne has (has been checked individually to have) red hair.” I am not convinced by this: the backing, it seems to me, is the enumeration of the facts of the sisters’ having red hair. How we actually establish those facts does not seem relevant — it is a case of what Toulmin (1958, p. 130) calls a comment on the nature of the data, as opposed to an extra bit of data. This can be parenthetically inserted in the backing, but it is not as fundamental as Hamby’s objection supposes.

Next comes a problematic passage (Toulmin, 1958, p. 117):

Even our chosen example, about the colour of Anne’s hair, may easily slip out of the analytic into the substantial class. If the backing for our step from datum, ‘Anne is Jack’s sister’, to conclusion, ‘Anne has red hair’, is just the information that each of Jack’s sisters has *in the past* been observed to have red hair, then—one might argue—the argument is a substantial one even as it stands. After all, dyeing is not unknown. So ought we not to rewrite the argument in such a way as to bring out its substantial character openly? On this interpretation the argument will become:

Datum—Anne is one of Jack’s sisters;

Backing—All Jack’s sisters have previously been observed to have red hair;

Conclusion—So, presumably, Anne now has red hair.

The warrant relied on, for which the backing is here stated, will be of the form, ‘Any sister of Jack’s may be taken to have red hair’: for the reasons given, this warrant can be regarded as establishing no more than a presumption . . . It seems, then, that I can defend my conclusion about Anne’s hair with an unquestionably analytic argument only if at this very moment I have all of Jack’s sisters in sight, and so can back my warrant with the assurance that every one of Jack’s sisters has red hair at this moment. But, in such a situation, what need is there of an *argument* to establish the colour of Anne’s hair? And of what relevance is the other sisters’ hair-colour? The thing to do now is use one’s eyes, not hunt up a chain of reasoning. If the purpose of an argument is to establish conclusions about which we are not entirely confident by relating them back to other information about which we have greater assurance, it begins to be a little doubtful whether any genuine, practical argument could ever be properly analytic.

There is a major interpretative decision to be made here. The temptation is to see Toulmin as backtracking on his previous statement that the example given was analytic: when he says that it may slip into the substantial class, he may be interpreted as saying that it really *was* substantial as it stood, and to be proposing means of making it genuinely analytic.

I am not convinced that this is the best way of interpreting what he says. The difference between a substantial version and an analytic version of the argument may be small, but it is there, and Toulmin's argument does *not* slip into it. That one might easily slip is not the same as having slipped. *If* the backing involved facts about the past and the claim involved facts about the present, *then* the argument would slip into being substantial.⁷ As stated, though, the backing does *not* state facts about the past and *is* analytic. Moreover, the fact that it was at some past time that the backing – and what were facts about the present *then* – were checked, does not at all alter the fact that whenever the backing is checked the conclusion is checked also, and this suffices to make the argument analytic. The problem is not so much that the facts may have changed since one checked them, but that the facts to be checked are facts about the past and the conclusion is a fact about the present. Hamby (2012, pp. 121–22) takes the fact that the checking could be in the past to be a problem; in my view, the time of the checking is a pseudo-problem, an irrelevance, and the checking is always to be understood subjunctively. Toulmin's final statements in the passage seem to be a comment on the circularity exhibited by analytic arguments: if the only way that I know that the backing is true (or that the warrant is correct) is by knowing, in part, that the conclusion is true, then the argument is no use at all in helping me to learn something I did not already know by inference. This is basically the old complaint that the syllogism is circular, a *petitio principii*.

Toulmin proposes two tests for analyticity – the *tautology test* and the *verification test* – both of which seem designed as tests for circularity, whether it is a formal circularity or an epistemological circularity. I hope to show that the tautology test seems to be a test for formal circularity and the *verification test* for epistemological circularity.

⁷ It is substantial because the backing and the claim would be of different *logical types*.

The *tautology test* says that “if we string data, backing, and conclusion together to form a single sentence, we end up with an actual tautology” (Toulmin, 1958, p. 115) and “an argument from D to C will be called analytic if and only if the backing for the warrant authorizing it includes, explicitly or implicitly, the information conveyed in the conclusion itself” (Toulmin, 1958, p. 116). Substantial arguments would be rightly ruled out by this test because by definition their data and conclusion are of different logical types, and such a combination can never result in a tautology. An interesting thing to note here is that if there is a tautology then there is no model where the premises are true but the conclusion false and so the argument, by definition, is semantically valid, and conversely whatever is semantically valid will pass the test.

Toulmin seems to be dubious of our capacity to detect tautologies by inspection and so proposes a linguistic test: when “all” is in the major premise, “D, B, or *in other words* C” will be true, because C repeats something in the backing. We might question whether whatever is semantically valid will pass the test as described, since the *tautology test* has “in other words” and not simply “and”. I can’t see that this makes any difference, but if it does, semantic validity might be wider than analytic validity. But this would be enough to show that logicians can recognize the distinction Toulmin is drawing, even though it does not map directly onto their own formal/semantic distinction. Again, this seems aimed at capturing the *petitio principii* involved in something like “All Xs are Ys; this is an X; therefore, this is a Y” which is formally circular because the conclusion repeats something in the backing, and similarly it is epistemologically circular because in order to establish with certainty⁸ that “All Xs are Ys” is true we would have established it for the individual in question. This is arguably even more so for the *verification test*, as we will see.

⁸ It is worth noting that the accusation of circularity rests entirely on the questionable assumption that “All Xs are Ys” has to be established: i) with certainty, and; ii) by complete enumeration. If it does not have to be established with certainty, or can be established with certainty by something other than complete enumeration, then the accusation is out of place. Also, if we are not taking “All Xs are Ys” not as a syllogistic premise but as a premise in modern logic that allows it to be vacuously true, there is no circularity in the absence of the other premise, for it is the other premise that guarantees that if the general statement is true it is true non-vacuously.

There is a slight curiosity here that it is worth pointing out. Toulmin says that the conclusion repeats something *in the backing*. If the conclusion repeats something that is not in the backing but is *in the data*, the argument does not qualify as analytic, despite being undoubtedly circular. It is not altogether clear whether Toulmin intends to rule such arguments out from being analytically valid or not, but undoubtedly his tests as they are defined do rule them out. In contrast, where he says (1958, p. 139) that “a valid analytic syllogism cannot in its conclusion tell us anything not already included in the data and warrant-backing” it seems that he wants to count arguments whose conclusion repeats something in the data to be analytic also. We might, then, conceive of wider and narrower interpretations of the tests, depending on whether we want to include the data. I will show later that Hamby (2012) actually assumes the wide interpretation of the *tautology test* but a narrow interpretation of the *verification test*. For the most part, I will follow Hamby in this, not because I am convinced that this is correct, but because I think I can make the points I want to make with this wider conception, and if I can then the same points will follow *a fortiori* for the narrower conception as well.

Apart from the limitation of only applying when there is an “all” in the major premise, Toulmin thinks that the *tautology test* can generate false negatives:

Petersen is a Swede
 Scarcely any Swedes are Roman Catholics
 So, almost certainly, Petersen is not a Roman Catholic

is a quasi-syllogism and should be judged analytic, but it does not pass the *tautology test*.

Expanding the warrant into its backing, e.g., “The proportion of Roman Catholic Swedes is less than 5%” will not give you a tautology when combined with the data and claim in the *tautology test*. If, instead of “scarcely any” we had “no”, we would have a tautology because “Petersen is not a Roman Catholic” would just be repeating something stated in the backing. Saying “Petersen is not a Roman Catholic” adds extra information to the argument as it currently stands. This is so equally, Toulmin (1958, p. 122) says, for “Almost certainly, Petersen is not a Roman Catholic”.

It is worth noting that this last follows for Toulmin because he takes “almost certainly” to qualify the claim; if we were to take it as qualifying the relation of the claim to the data, that is to say, as designating a probabilistic relation between the premises and the conclusion (which is how I said earlier the logician would classify an argument as probable), we might question whether adding “Almost certainly, Petersen is not a Roman Catholic” does add extra information, since it is difficult – if all we know about Petersen is that he is a Swede – to see how we are saying any more than that most Swedes are not Roman Catholic when we say that Petersen is almost certainly not a Roman Catholic. Toulmin concedes that if we define “almost certain” in terms of proportion and frequency, it *does* pass the *tautology test*.

He finds this way of talking about probabilities mistaken, and bound to lead to paradox. For instance, “a man can say, with perfect propriety, ‘Petersen is a Swede and the proportion of Roman Catholic Swedes is very low, and yet Petersen is almost certainly a Roman Catholic’ ... if he knows something about Petersen that places him in the Roman Catholic minority—whereas, if the original statement were a tautology, this new statement would be bound to be a self-contradiction” (Toulmin, 1958, p. 124). What Toulmin seems to be saying is that on his view that it is analytic but not a tautology, it can make sense to deny the conclusion of the original argument should we learn something else about Petersen, e.g., that he is a Roman Catholic. If his opponents say that Petersen is almost certainly a Roman Catholic, on the other hand, then this is contrary to what they said before, and since what they said before was a tautology, to say this must be an outright contradiction. Toulmin is entitled to deny the conclusion, then, on acquiring new information, while his opponents are not.

As far as it goes, this analysis is correct: if I say “P; therefore, almost certainly Q” then I cannot say “P; therefore, almost certainly not Q”. I can, however, say, “P; N; therefore, almost certainly not Q” – when N is the new information – without any contradiction. And, in fact, it is precisely because I can do this that I can still say “P; therefore, almost certainly Q” and still say something that I consider true. For someone taking this view it is quite legitimate to say “It is improbable for Petersen to be a Roman Catholic, but nonetheless true” because this is elliptical for saying “It is improbable for Petersen to be a Roman Catholic given that he is a Swede and very

few Swedes are Roman Catholics, but it is nonetheless true". It is precisely for such reasons that proponents of this view argue that modal qualifiers should usually be taken as modifying the relation between the data and the claim, rather than, as Toulmin does, as modifying the claim. Toulmin has many arguments against this view of modal qualifiers and probabilities that cannot be surveyed here. Here, I will limit myself to making the point that Toulmin's argument presupposes his own view of modal qualifiers and so begs the question against his putative opponents, who are saying something perfectly intelligible and non-contradictory according to their own views on probability and modal qualifiers.

The *verification test* is then proposed as an alternative that does not need "all" or "no" to occur in the major premise: an argument is analytic if and only if "checking the backing of the warrant involves *ipso facto* checking the truth or falsity of the conclusion . . . whether a knowledge of the full backing would in fact verify the conclusion or falsify it" (Toulmin 1958, p. 123).⁹ It is worth noting again that according to the definition it is the *backing* that is in question; it is quite irrelevant, as far as passing the *verification test* goes, what the *data* is. This test seems to capture the idea of *epistemological circularity* — if the only way of knowing for certain that the major premise of a syllogism is true involves knowing that the conclusion is true, then we have an epistemological circularity but not necessarily a formal circularity. Admittedly, the fact that Toulmin seems to allow that checking the backing could *falsify* the conclusion — allowing arguments with false conclusions to pass the test and be counted as analytically valid — means that passing the test is not quite the same as being epistemologically circular. I will come back to this.

Toulmin extends this idea in two ways. The first way is quite trivial, namely that we do not need to suppose that what we are checking is a general statement. The second way is more interesting and goes beyond what is normally considered circularity, which is that it is intended to apply to statistical generalizations. This allows statistical arguments like that above to be analytic, because in order to establish that less than 5% of Swedes are

⁹ Remember that this checking is to be understood subjunctively: were we to check the backing, we would check the conclusion. This is not altered in the slightest by the fact that we may have carried out a checking some time ago and facts may have changed since then.

Roman Catholics we would have to have established for each Swede, and *ipso facto* for Petersen, whether they are Roman Catholic or not.

This being the case, is

Petersen is a Swede

Scarcely any Swedes are Roman Catholics

So, almost certainly, Petersen is a Roman Catholic

also analytic, albeit with a false conclusion? It seems to satisfy the test as it has been written here (Cooley 1960; Hamby 2012, p. 126), and we have seen already that having a false conclusion does not itself rule out the argument's being analytically valid. Yet, as Hamby (2012, p. 126) points out, Toulmin cannot intend for such arguments to count as analytic, noting that Toulmin describes this argument as "not just implausible but incomprehensible" and implies that it is not valid at (1958, p. 122) without apparently noticing that it passes the *verification test*.

I will suggest one possible explanation here, though I will give what I think is a better one later: one might suspect that Toulmin finds the argument so implausible that it does not occur to him to ask whether it passes the test, and one of the reasons he finds it so implausible is that he has already judged that it does not pass a third test called the *self-evidence test*, which is to ask: can someone who grasps the data, backing and conclusion still raise questions about its validity? Perhaps it is only arguments that have passed the *self-evidence test* that are submitted to the *verification test*, so that the two tests together are meant to be jointly sufficient. There is little evidence of this being Toulmin's view, though: Toulmin seems to consider the *verification test* as his most reliable test.

Also, one might object that, even in a completed survey, we might not know whether Petersen specifically is a Roman Catholic, because we might have compiled the survey in a way so that we only know the numbers. Even so, we do check whether Petersen is a Roman Catholic, even if we do not know that that is what we are doing. So I think the argument still comes out as analytic; however, it is not obvious to me that – having checked the backing, when it has been compiled in this way – it would be epistemologically circular to infer the conclusion, as it would be if checking the backing told us exactly who was Roman Catholic and who was not. In what follows,

it will be assumed that the survey was completed in such a way as to make the inference in question circular.

Toulmin's probability example is interesting. Although I disagree with how Toulmin uses the modal qualifier, there is an intuitive plausibility in his claim that, using the qualifier the way he uses it, the argument he gives is valid. It is worthwhile to consider it, then, on its own terms. One can imagine him reasoning as follows:

1. Syllogisms like "All Xs are Ys; this is an X; therefore, this is a Y" are epistemologically circular supposing that "All Xs are Ys" is known by complete enumeration.
2. In fact, since it is the complete enumeration that makes the argument circular, the sub-argument "All Xs are Ys; therefore, this is a Y" is also circular.
3. What we have to do, then, is determine whether checking the major premise/backing involves checking the conclusion — this is the *verification test*, and it should be noted that the minor premise/data is irrelevant here.
4. If the rationale for calling this epistemologically circular is that it involves complete enumeration, then any premise which requires complete enumeration in order to be established will form an epistemologically circular argument when the conclusion is one of the items enumerated.
5. Statistical statements about a population such as "n% of Xs are Ys" requires complete enumeration; therefore, if "This X is a Y" is one of these items, "n% of Xs are Ys; so, This X is a Y" is epistemologically circular.
6. Similarly, if "This X is not a Y" is one of these items, "n% of Xs are Ys; so, This X is not a Y" is epistemologically circular.
7. Supposing that we cannot check directly whether the X in question is or is not a Y, but know that it is very likely given a high value for n, we should modify our claim, giving us the argument "n% of Xs are Ys; so, almost certainly, this X is a Y".¹⁰

¹⁰ One might suspect a fallacy of sweeping generalization or ignoring exceptions here; after all, we do not know that this X is not in the (100 - n%) of Xs that are not Y. I think this

8. Since we are fully justified in making this modally qualified claim, this argument is valid. (If we could see directly that the claim is true, the modal qualifier to use would be “certainly”. It would no longer be appropriate to use the qualifier “almost certainly”, for this implies a reservation that we do not have).
9. It might be false that this X is a Y. Indeed, we have already seen that its falsity – namely, “This X is not a Y” – may follow in just as circular a fashion as “This X is a Y.” Also, if in fact it is false, the argument “n% of Xs are Ys; so, this X is a Y” will not, in fact, be epistemologically circular. But, supposing once again that we cannot check this directly but are making an estimate depending on the value of n, we could not be justified in saying “n% of Xs are Ys; so, almost certainly, this X is not a Y”, and although “n% of Xs are Ys; so, this X is a Y” is not epistemologically circular, we are justified in thinking that it is when n is high.
10. It is possible, then, that the conclusion of the argument (minus the qualifier) is false, but we would still call the argument valid because entitled to make the claim once it has been appropriately modally qualified.
11. So, checking the complete backing might in fact verify that this X is not a Y.
12. “Data; Backing; so, Claim” is not formally valid since if it were the conclusion could not be false. Similarly with regards to its being semantically valid.
13. Nevertheless, the argument is *analytically valid*.
14. Therefore, some arguments are analytic yet not necessary but only probable.
15. *Analytic arguments* are those which we are justified in thinking to be epistemologically circular/semantically valid, though qualified to indicate that we cannot be certain.

is wrong: in the absence of any particular reason to think that this X is one of this minority, it would only be a fallacy if we were insisting on “This X is a Y” as a certainty. Adding “almost certain” makes it explicit that that is not what we are doing.

So, Cooley and Hamby would be quite right to say that the argument concluding “Almost certainly, this X is not a Y” passes the *verification test*.

It is worth noting that we can claim on similar grounds that the sub-arguments in (5) and (6) – those which conclude “This X is a Y” and “This X is not a Y” respectively – are semantically valid when their conclusions are true. Is it actually possible for the conclusion of either argument to be false if the premise (viz. the complete enumeration) is true? Certainly, we may reasonably think that it is false. But it cannot actually be false, since it is a repetition of one of the items enumerated. It is only because the enumeration is unexpanded that we can conceive of the conclusion's being false. For the same reason, I think it could be said to pass the *tautology test*. If so, the argument “n% of Xs are Ys; so, this X is not a Y” passes both the *tautology test* and the *verification test*. *Contra* Toulmin, I do not think that this is a case where the *tautology test* fails and the *verification test* works. In fact, when expanded it seems to be not just semantically valid but formally valid. However, if we qualify the conclusion as “almost certainly” and in this way allow there to be false conclusions, Toulmin is right: an argument with a false conclusion cannot pass the *tautology test* but it can pass the *verification test*.

That passing these tests is not sufficient, either individually or together, for an argument to be analytically valid, turns out to be because of a separate issue concerning the qualifiers. What makes “n% of Xs are Ys; so, almost certainly this X is a Y” analytic while “n% of Xs are Ys; so, almost certainly this X is not a Y” not analytic is not the *verification test* alone (since they both pass it) but also the match between the probability and the modal qualification of the claim. We can see this more easily if we re-introduce the warrant, because the claim embedded in the warrant must be modally qualified in the same way. The argument “Petersen is a Swede; Scarcely any Swedes are Roman Catholics; So, almost certainly, Petersen is a Roman Catholic” or “Petersen is a Swede; Scarcely any Swedes are Roman Catholics; So, it is highly improbable that Petersen is not a Roman Catholic” can be seen to be unintelligible by direct inspection of the modal qualifiers. Toulmin takes this for granted, and so wrongly says that an argument is analytic if and only if it passes the *verification test*. An important corollary is that the *verification test* itself does not do much different than answer the model-theoretic question “Is it possible for the premises to be true and

the conclusion false?" It will not answer it in all cases because (construed narrowly) it does not consider the data at all, confining itself entirely to the backing and claim. But it does answer it in a theoretically significant subset of cases, namely those that are accused of being *petitio principii* because of generalizations known by complete enumeration. Toulmin makes an interesting extension to statistical generalizations, and I think he is right. The resemblance to the model-theoretic conception is even more obvious with the *tautology test*, which is practically the same as the model-theoretic question.

Hamby (2012, pp. 126-28) objects further that there are quasi-syllogisms that fail the *verification test* but pass the *tautology test*:

Petersen has a mustache

Every person whom I have met whose name is Petersen is a Swede, and
every person whom I have met who has a mustache is a man

So, Petersen is a Swedish man

Does it pass the *tautology test*? From the fact that someone is called "Petersen" I am entitled to conclude that they are a Swede, from the first clause of my backing. From the fact that Petersen has a mustache (the data) and every person I have met with a mustache is a man (the second clause of my backing) I am entitled to conclude that Petersen is a man. Hence, by conjunction, I am entitled to conclude that Petersen is a Swedish man. According to Hamby, the conclusion repeats what was said in the premises, so it does seem to pass the *tautology test*. Obviously, it will not pass the *verification test*. There is a very general scheme for generating such counter-examples: the *verification test* does not consider the data, so a conclusion that repeats something in the data alone or derived from the data alongside the backing will pass the *tautology test* but not the *verification test*; the *verification test* is both wider and narrower than the *tautology test*. But this amounts to every formally valid argument whatever as long as it does not have a redundant premise (Hamby, 2012, pp. 125-28).

There are two things to be said about this. Firstly, Hamby is construing the *tautology test* widely to include the data, since on the narrower construal of the test one cannot say that it is passed because the conclusion repeats what was said in the *premises*. The conclusion does not repeat anything said

in the *backing*, so it does not pass the *tautology test* on the given definition of that test. Also, if we were to construe the *verification test* widely as well, then it would pass both tests. It is only by construing the *tautology test* widely and the *verification test* narrowly that we can get this case.

Let us for the moment assume that this is, in fact, the best way to construe these tests; as I have said, such a view is not without textual support. This brings me to my second point: is this actually a problem? It is a problem for Toulmin's claims about the sufficiency of the *verification test*, but we have already conceded that Toulmin is wrong about this. Is there anything else that need concern us? I don't see that there is. Remember that formally valid arguments are a proper subset of semantically valid arguments, so it does not seem to be the flaw that Hamby takes it to be that all formally valid arguments, or, as he prefers to put it, all arguments with a good warrant, are analytic arguments. Perhaps his worry is that substantial arguments too can have good warrants, so the analytic/substantial distinction would disappear altogether. I do not think this is true: since substantial arguments will by definition have conclusions of a different logical type to their backings, they will not pass the *tautology test* by definition. If, somehow, it does pass the *tautology test*, what moral should we draw from this? Not, it seems to me, that Toulmin's concept of analytic arguments is incoherent, but that his concept of substantial arguments as something distinct from analytic arguments is incoherent: the distinction Toulmin wants to draw between analytic and (valid) substantial arguments does not really exist.

3. Conclusion

I disagree with Toulmin's analysis of modal qualifiers and, by extension, the way he draws the necessary/probable distinction, and his whole discussion of probability. Most fundamentally, I think that Toulmin has utterly confused the question of whether one thing follows validly (however we cash out "validly") from another and the question of what we take to justify the use of a particular modal qualifier. This is in part due to Toulmin's habit of taking the modal qualifier always as modifying the conclusion. These are all issues that will have to be discussed elsewhere.

I also disagree with Toulmin's statement about the sufficiency of the *verification test*. I disagree with his statement that in analytic arguments "Data; Backing; so, Claim" is formally valid — it does not seem to be true of probable arguments,¹¹ for he explicitly says that the conclusions of these may be false when he says that checking the complete backing may falsify the claim. It is for the same reason that such arguments will fail the *tautology test*.

However, I do not find Toulmin's account to be as incoherent as Hamby among others have claimed and have provided a line of reasoning that seems to justify Toulmin's judgment that probable (in both senses of the word "probable") arguments can be analytically valid, even though I deny that this validity can be established directly by any of the tests on their own. Toulmin's elaboration of the *petitio principii* objection into arguments involving statistical generalizations (because both universal generalizations and statistical generalizations involve complete enumerations) is interesting in its own right and worthy of serious study. Further, because checking the backing is to be understood subjunctively, Hamby's objection that it may have been carried out in the past is a pseudo-problem, and although he is right that certain arguments that Toulmin would not accept as analytically valid pass the *verification test* and, in consequence, the test is not as sufficient as Toulmin says, I have given a plausible explanation of how this is that deflates this objection.

My major concern, then, is not that Toulmin's account of analytic validity is incoherent, but whether it is not explicable in terms of a distinction between semantic validity and formal validity that is well-known to logicians.¹² This is the second strategy that I outlined at the start of the paper.

¹¹ Admittedly, it is not entirely clear that it is meant to be. It is a claim Toulmin makes with respect to his earlier argument about Jack's sisters, and in that case I think it is true: Hamby is wrong to take what is parenthesized in "Each one of Jack's sisters have (has been checked individually to have) red hair" as part of the content that has to be repeated in the claim in order for the argument to be formally valid. It is not obvious that he is putting the formal validity of "D; B; so, C" forward as a completely general claim about analytic arguments as a whole. I don't see how he can, since he seems to allow that C could be false.

¹² Also thinking Toulmin's account of analytic validity to be incoherent, Bermejo-Luque (2011, p. 93) offers an alternative definition of analytic arguments as arguments whose warrants are analytic truths. This makes analytic validity equivalent to semantic validity, and so not a problem for formal logicians. The rationale is that the inference from so-

This is important because Toulmin accuses formal logicians of conflating the categories of formal validity, analyticity, and necessity. Now, given that Toulmin is operating with a completely different conception of necessity and probability to the logicians, it is no surprise that there can be probable arguments as he defines that term that are formally and/or analytically valid. The question remaining, then, is whether they conflate formal validity and analytic validity or recognize any validity other than the formal. If it is the case that analytic validity as Toulmin defines it is the same as semantic validity, or differs from it only slightly, then Toulmin cannot justifiably accuse them of neglecting such a distinction and Toulmin's case collapses.

It must be admitted that analytic validity is not the same as semantic validity. However, passing the *tautology test* is the same as semantic validity (when construed widely) or as a theoretically significant proper subset thereof (when construed narrowly), and passing the *verification test* implies that if the conclusion (minus the qualifier) is true, the argument would be semantically valid. It is because Toulmin wants to allow quasi-syllogisms to be analytically valid when the conclusion (minus the qualifier) is *false* that we get the complications; Toulmin's idea is that an appropriately hedged conclusion *can* follow analytically in this case, and I think he is right on this score, but the *verification test* that he proposes to deal with this problem is too weak as Toulmin defines it. That neither of these tests are, in fact, sufficient, is due to the modal qualifications of the warrant and the claim, which have to match. When there is such a match the situation is one where, even when the argument is not circular, whoever puts it forward has good reasons to think that it is and no reason to think it is not, though acknowledging the possibility that it is not by qualifying the claim. I take

something like “This apple is green” to “This apple is coloured” is truth-preserving in every possible world and so model-theoretically valid though not proof-theoretically valid. This will always be the case when the premise that needs to be added in order to make it formally valid is an analytic truth, for such truths are, by definition, true in all possible worlds and cannot make a bad inference into a good one — it was good all along. This also follows for arguments like “Peter is older than Paul; Paul is older than Phil; therefore, Peter is older than Phil.” The conclusion does seem pre-theoretically to follow logically from the premises, but to make it formally valid we have to add a statement to the effect that the relation *older than* is transitive. Such a statement is arguably an analytic truth. In light of this, logicians would often describe these arguments too as necessary, thereby giving necessary arguments a wider extension than those that are formally valid.

this to be close enough to semantic validity that Toulmin cannot justifiedly claim that logicians do not, or could not, recognize the distinction between formally valid and analytically valid arguments; nor would they find themselves forced to judge those analytic arguments that are not formally valid as invalid. On the contrary, Tarski's proposal of the model-theoretical conception of validity was precisely an attempt to count as valid certain examples where one thing seemed intuitively to follow logically from another even though they were not formally valid but true in virtue of the meanings of the terms used, e.g., "This apple is green; therefore, it is coloured".

Where logicians do 'conflate' distinctions (i.e., formally valid arguments with those expressed in logical words) they are not mistaken in doing so, and where it would be a mistake (i.e., formally valid arguments with analytic arguments) they do not do so. As for necessary and probable arguments, logicians have a completely different understanding of this distinction than Toulmin; it would not be a mistake, on *their* understanding of necessity, to 'conflate' it with formal validity, and they would not conflate Toulmin's understanding of necessity with formal validity or with anything else in these distinctions.

True, I have not said anything in this paper about substantial validity. Obviously, Toulmin would not claim that there are substantially valid arguments that are formally valid and/or expressed in logical words. He does say that there are substantially valid arguments whose conclusions can be stated unequivocally and so given the qualifier "necessarily", but, clearly, such arguments will not be necessary on the logician's own conception of necessary/probable distinction and so not a counter-example. The question whether substantially valid arguments are valid at all, and what their validity-claim amounts to, must be left for another time, however.

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