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## Truth and the Unity of Logical Validity

**Abstract.** According to a traditional view, logical validity consists in necessary truth preservation. Such an account has been argued to carry an apparent commitment to a unique property of truth to be preserved from premises to conclusion. Recent discussions, however, have concluded that if the metaphor of truth preservation is carefully unpacked, no need for a unique property is there. All is needed is that certain structural relations among instantiations of truth properties hold. Against this view, we argue that a unique general truth property is indeed required by logical validity. We first show that the unpacking should be correctly understood since it imposes constraints on the concept and the properties of truth. We then demonstrate that, under such constraints, a general property is not imposed by truth preservation but by another feature of validity: its uniformity. Finally, some options that could be attempted to resist this result are discussed, showing that (strong) truth pluralism and deflationism are affected in different ways.

**Keywords:** logical validity; truth; alethic pluralism; deflationism; logical pluralism; mixed inferences

### 1. Introduction

A quite traditional view holds that logical validity consists in necessary truth preservation. Accordingly, valid arguments are identified with those in which the truth of the premises necessarily guarantees the truth of the conclusion. If an inference is valid, in the passage from premises to conclusion, truth cannot be lost. The backbone of this view is that the property of logical validity, had by certain arguments, is to be explained in terms of a semantic property that can be borne by premises and conclusion, namely a property of truth (see [Gamester, 2019](#); see

also [Williamson, 1994](#); [Tappolet, 1997, 2000](#); [Lynch, 2009](#)). With the introduction of truth pluralism in the philosophical debate, a question about such a view has become pressing: Does a semantic account require a unique property of truth, so that only one truth property is to be transmitted in a valid inference? Until recently, this was hardly an issue, since the possibility of admitting more than one property of truth was not even entertained. Soon after truth pluralism had been laid down, however, several authors have been quick to point out that truth pluralism seems to conflict with this semantic understanding of logical validity ([Gamester, 2019](#)). If, as licensed by truth pluralism, premises and conclusions of valid arguments exemplify different truth properties, then what truth property is preserved? This question sparked a specific debate, labelled as “the problem of mixed inferences”, which stems exactly from the assumption that the semantic account requires a single property of truth ([Gamester, 2019](#)).

Against this received assumption, however, it has been recently argued that the alleged tension is illusory. According to some authors, once the traditional semantic account of logical validity is carefully scrutinised and precisely stated, the seeming need for a single property of truth fades away.<sup>1</sup> Far from imposing a commitment to a general property of truth, the traditional semantic account of logical validity is neutral on how many properties of truth there are. Neither monist nor pluralist conceptions of truth are ruled out. Is such a verdict correct? Or does the traditional semantic notion of validity require a single property of truth after all? In this paper, we discuss this issue and give an affirmative answer to the latter question, arguing that a unique general property is indeed required. In particular, we stress that the key point does not lie in truth preservation -on which the truth pluralism debate focused so far- but in another, neglected aspect, namely the uniformity of logical validity.

The plan of the paper is the following. In Section 2, the metaphor of truth preservation is unpacked, showing, in accordance with recent literature, that it hinges on structural relations of truth instantiation. In Section 3, the role of generic truth in such an unpacking is discussed, arguing that, to avoid a commitment to a general property of truth, concepts and properties must be distinguished and a certain metaphysics of

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<sup>1</sup> We choose arguments with the same logical form in order to avoid distracting complications. What is relevant here, however, is just that different truth properties are involved in different arguments, regardless of their logical forms. The possible resort to logical form is discussed again below.

truth adopted. In Section 4, we show that a plurality of truth properties leads to a plurality of properties of logical validity. Accordingly, the uniformity of validity is lost. In the next sections (5, 6, 7) we discuss three possible ways to fix this outcome and secure the uniformity of validity while avoiding a generic property of truth. We show that no strategy succeeds. The upshot is that if logical validity is a substantial uniform property of valid arguments, and it consists in necessary truth preservation, then a general substantial property of truth is required. In Section 8 the consequences of this result are explored. In particular, we argue that deflationism is also affected, although to a lesser extent, and we discuss the viability for truth pluralism of just accepting the fragmentation of validity. While a truth pluralist could defend the idea that the property of logical validity is not uniform by joining forces with logical pluralism, such an option is not as simple as it seems. Section 9 concludes the paper.

## 2. Unpacking truth preservation

The idea that the semantic account of logical validity requires a single property of truth to be transmitted from premises to conclusion is *prima facie* appealing. If logical validity consists in necessary truth preservation (by assumption), then “there must be a single property that the truth of every sentence involved consists in, for it is the necessary preservation of this property that the validity of the inference consists in”.<sup>2</sup> If a property is transmitted from premises to conclusion, then a single property must be at stake. However, some authors have argued that this impression is due to a hasty and superficial reading of logical validity that, if carefully scrutinised, reveals no such a commitment to a unique truth property.<sup>3</sup> To show this, it has been pointed out that the usual characterization of logical validity as truth *preservation* should be considered, strictly speaking, as a mere metaphor. The semantic account should not be taken to literally mean that there is a certain property that is preserved through time in the passage from premises to conclusion.

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<sup>2</sup> This point is usually neglected. Lynch (2009), for example, says explicitly something similar with respect to the normativity of truth. For normativity, however, the problem he discusses is not metaphysical fragmentation, but the derivation of single instances from a general norm and our acceptance of them.

<sup>3</sup> We use “notion” when it is not specified whether a concept or a property is at stake.

On the one hand, there is no temporal dimension in logical inferences, so that the alleged preservation is not diachronic. On the other hand, there are cases, such as 0-premises valid arguments or inferences with contradictory premises, where there cannot be any transmission of a truth property at all. If we unpack the metaphor, logical validity should rather be understood by means of a conditional in which the truth of the premises (if any) and the truth of the conclusion are necessarily related. Instead of literal preservation of a truth property, the constraint states that a conclusion of a valid argument cannot fail to be true if its premises are true. Accordingly, what matters is just that sentences depend on each other in the right ways, namely that certain structural dependencies hold. While such an accurate reformulation seems innocuous, it leads to a view of validity that does not hinge on a single property of truth. If the constraint is structural, no monistic requirement on truth is imposed. Instead, the real content of the semantic account of validity is more precisely provided by the following weaker and more general principle, put forward by Will Gamester

*Semantic Validity Constraint (SVC):*

For any valid argument from premises  $\{A_1, \dots, A_n\}$  to conclusion  $B$ , if the truth of  $A_1$  consists in  $F_1, \dots$ , the truth of  $A_n$  in  $F_n$ , and the truth of  $B$  in  $G$ , then  $F_1, \dots, F_n$ , and  $G$  are such that: necessarily, if ( $A_1$  is  $F_1, \dots$ , and  $A_n$  is  $F_n$ , then  $B$  is  $G$ . (Lynch, 2009, p. 61)

SVC is supposed to capture a more accurate picture of what is at stake in the idea of validity as truth preservation by focusing on relations of exemplifications of truth. In other words, rather than being about the preservation of a certain truth property, logical validity captures a sort of covariance of truth instantiations between premises and conclusion. In a valid argument, if the premises have their truth properties, also the conclusion must have its truth property. Once formulated in such terms, the constraint becomes open to both monistic and pluralistic interpretations, with the monist contention being that the relationship between  $F_1, \dots, F_n$  and  $G$  is identity, whereas for the pluralist it is not. Indeed, given that what matters in logical validity are just structural truth dependencies, the identity between  $F_1, \dots, F_n$  and  $G$  is unessential to logical validity. Whether there is a single property of truth or not is a question not dictated by inquiries on logical validity, which, on this, remains neutral (Lewis, 1983; see Edwards, 2013, 2018; Asay, 2014 for the distinction applied to truth).

### 3. The role of generic truth in SVC

It is important that we spend some words to understand what SVC relies on. In particular, we should clearly assess the role played by the notion of generic truth.<sup>4</sup> As is apparent, in fact, a single general notion of truth is explicitly involved in SVC, since it states that “if the *truth* of  $A_1$  consists in  $F_1, \dots$ , the *truth* of  $A_n$  in  $F_n$ , and the *truth* of  $B$  in  $G \dots$ ”. Since all  $F_1, \dots, F_n$  and  $G$  are ways in which a unique, seemingly general *truth* can be, it is natural to wonder whether such an appeal does not already carry a commitment to a single general property of truth. After all, if those putative properties all consist in the same property-truth — they are one in some sense. It could then be worried that, against what is suggested above, SVC does need a unique property of truth, for it invokes such a property in its very formulation. This worry, however, can be dispelled by elaborating on themes proposed by deflationism and strong alethic pluralism, which we quickly rehearse below. These distinctions are essential to grasp the problem of fragmentation emerging later in the paper.

First of all, a reasonable distinction is to be traced between concepts (and related linguistic expressions) and properties. Although what concepts and properties are is a difficult question on which cognitive scientists and philosophers disagree, in this context we understand concepts as (mental) representational devices employed to represent reality, whereas properties typically lie on the reality side that concepts represent.<sup>5</sup> This is of course very rough, but the distinction should be familiar enough for our purposes, and has been already extensively articulated elsewhere. In particular, we should distinguish between truth concepts and truth properties (see [Beall and Restal, 2006](#)). Second, it has been pointed out that a single concept can denote different properties. To illustrate this possibility Michael Lynch proposes an analogy with the definite description “the colour of the sky at noon” which arguably provides a single concept but picks out different colors (see [Williamson, 1994](#); [Tappolet, 1997](#)). In general, the point is that we should not assume that the representational level and the level of reality are perfectly aligned. Discrepancies can occur in different ways, including the number of selected

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<sup>4</sup> We could also have one property but many concepts. This case, however, is irrelevant for the rest of the discussion.

<sup>5</sup> A similar reasoning would apply to soundness. For example, if the unity of validity is vindicated by a single truth property, also the unity of soundness can be similarly recovered, since premises would all be true in the same way.

entities.<sup>6</sup> In a sense, these two remarks -the distinction between concepts and properties, and their potential divergence- are just an effect of the usual division between epistemology and metaphysics. For our concerns, the upshot is that once concepts and properties are distinguished and it is established that a concept can go with many properties, then a solution to the problem above suggests itself. As long as SVC only involves a general *concept* of truth, the commitment to a unique general property of truth is avoided. Surely, we employ concepts and words to represent and speak of reality, so that, unless some sort of semantic ascent is in play, SVC seems to be about a property of truth, not about a concept. However, SVC can be reformulated in terms of a truth concept without apparently betraying its spirit. Accordingly, to avoid possible confusions, SVC may be restated explicitly thus:

*SVC\**:

For any valid argument from premises  $\{A_1, \dots, A_n\}$  to conclusion  $B$ , if  $A_1$  is  $F_1$ ,  $\dots$ , and  $F_1$  is denoted by *the concept* of truth,  $\dots$ ,  $A_n$  is  $F_n$ , and  $F_n$  is denoted by *the concept* of truth,  $\dots$ ,  $B$  is  $G$  and  $G$  is denoted by *the concept* of truth, then  $F_1, \dots, F_n$ , and  $G$  are such that: necessarily, if  $A_1$  is  $F_1, \dots, A_n$  is  $F_n$ , then  $B$  is  $G$ .

Since more than one truth property could be denoted by a single truth concept, that a single *concept* of truth is used in *SVC\** is not indicative that a single truth *property* is also invoked. The initial worry that a commitment to a general truth property was already incurred in the formulation of the semantic account is neutralised.

A rejoinder, however, could be put forward. One could insist that, once a single concept of truth is admitted, a general property of truth is still looming. After all, a general concept arguably defines an extension and thus somehow still corresponds to a property. So, even if other properties are denoted, a general one also is: The property of falling under the concept of truth.<sup>7</sup> Such a unique general property of truth is still implicitly postulated to formulate the semantic account of logical validity. It is to neutralise this rejoinder that deflationism comes in

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<sup>6</sup> See (Pedersen, 2006; Wright, 2013; Lynch and Pedersen, 2018; Gamester, 2019). Since Gamester provides the most articulated version of the argument, we mostly conform to his formulation.

<sup>7</sup> Here we take the liberty of using single quotation marks to indicate truth bearers — e.g., propositions — because using *that* clauses would make the formulation awkward.

particularly handy. By adopting a deflationist theme, it can be argued that in some contexts the role of a truth concept is merely expressive. It serves as a logico-grammatical device allowing us to shorten (possibly infinitely) long conjunctions and disjunctions into generalisations. Deflationists illustrated how such machinery works in great detail.<sup>8</sup> While deflationism holds that truth only serves expressive purposes in every context, for our present concerns, however, it is enough that the truth concept serves a merely expressive role in SVC\*. Next, by keeping following deflationism, it can be held that, as long as the generic concept of truth plays a merely expressive role, it stands for an insubstantial property at most. The idea is that, even if a truth concept defines an extension and thus picks out a corresponding property, such a property is just a by-product of its grammatical nature. Nothing metaphysically deep or substantial is to be admitted.<sup>9</sup>

If one insisted on having clarification on what such a putative insubstantiality amounts to, then the claim could be further articulated, for example, in terms of the Lewisian distinction between sparse and abundant properties.<sup>10</sup> Sparse properties are joint-carving and correspond to objective resemblance and causal-explanatory roles, while abundant properties correspond to the extension of any concept or predicate, irrespective of objective uniformity. In other words, a concept (or predicate) alone does not *per se* guarantee that a uniform class of individuals has been identified. A uniform class only comes with a concept capturing a joint-carving, sparse property. Substantiality is thus accounted for in

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<sup>8</sup> Take  $A_1$ . The rough idea would be that an alternative account, such as a proof-theoretic one, would explain its validity by showing that ‘two plus two equals four’ is derivable from ‘snow is white and two plus two equals four’. This would imply that *necessarily, if snow is white and two plus two equals four, then two plus two equals four*. By truisms, we could get that *necessarily, if ‘snow is white and two plus two equals four’ is  $F_1$ , then, ‘two plus two equals four’ is  $F_2$* , which is an instance of SVC. Hence, a detour through area-specific truth properties would be licensed but non-essential.

<sup>9</sup> Through the paper we mostly use a seemingly realist vocabulary with regard to properties. The only reason for this is ease of exposition and not a commitment to a realist metaphysics. Indeed, the issue discussed here is largely independent of the metaphysics of properties (as shown in (Stollo, 2022a)), and it could be reformulated, for example, in a nominalist jargon speaking of objective similarities among individuals rather than properties.

<sup>10</sup> On the debate of mixed inferences see, e.g., (Pedersen, 2006; Cotnoir, 2013; Edwards, 2013; Yu, 2017; Stollo, 2017).

terms of metaphysical uniformity and causal-explanatory efficiency. In general, the possibility of abundant properties should not be particularly surprising, since examples of possible mismatch between concepts and reality are easy to provide, from flogisto (where the concept does not pick up a real entity) to Goodman's grue (where gerrymandered items are gathered together), from jade (whose concept gathers two different kinds) to polysemous expressions, and so on. Following this route, the insubstantiality of truth is clarified by holding that as long as a truth concept only serves an expressive role, it is not bound to carve the class of truth bearers at any joint. Accordingly, deflationary truth is not a sparse property of truth bearers displaying objective agreement on a certain attribute (see Lynch and Pedersen, 2018; Gamester, 2019; Stollo, 2017). Since truth is not joint-carving, gathering true propositions together *qua truths* results in a gerrymandered collection to which only a property in the abundant sense (namely as an extension of a predicate) can be associated. Lack of a substantial generic truth property corresponds to lack of uniformity. In a nutshell, if a property is not substantial, it is not sparse, therefore it is not uniform. Note that the contrast between substantial/sparse/uniform and insubstantial/abundant/non-uniform properties is crucial to have a sensible formulation of deflationism and strong pluralism and claim that they can afford an account of validity like SVC\*. This is the theoretical work the distinction does for us.

Although strong pluralists accept the deflationist view with respect to a general property of truth, they are more tolerant with respect to area-specific truth properties. Contra deflationism, a strong pluralist holds that there is uniformity and objective similarity among true propositions, but these are limited to true propositions belonging to the same area of discourse (see, e.g., Horwich, 1998). For strong pluralism there is a plurality of area-specific sparse properties of truth. Moreover, since they are all *truth* properties, and not properties whatsoever, they cannot be completely disparate. This point is usually clarified by alethic pluralists by means of platitudes or truisms about truth (see Asay, 2013, 2021; Edwards, 2018). Such platitudes typically include principles such as: *It is true that p if and only if p*; *To assert is to present as true*; *Aptitude for truth is preserved under basic logical operations*; etc. The idea is that to count as a truth property, a property must validate these truisms.<sup>11</sup>

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<sup>11</sup> Or the property of having at least one truth property denoted by the concept of truth.



Under the light of such platitudes, it seems then natural to conclude that there is a precise sense in which truths from different domains are uniform: they all satisfy the truisms. A corresponding generic truth property seems implicit in the resort to truisms. To escape a quick collapse into moderate pluralism, however, a strong pluralist can stress, once again, the distinction between concepts and properties, holding that the uniformity captured by the truisms only takes place at the level of the concept of truth rather than at the level of the properties of truth.<sup>12</sup>

For the sake of clarity, a last point is worth making. To balance these remarks we had better stress that SVC\* is not intended to favour a pluralist reading. That a general property of truth is not forced does not mean that it is excluded. SVC\* is just proposed as a non-question-begging way of framing the semantic account, leaving open the issue of how many truth properties there are. The moral of the above discussion is that such questions about truth are left undecided by considerations on logical validity. If there were independent reasons to think that, after all, there is only one substantial property of truth, so that truth monists are right, then  $F_1, \dots, F_n, G$  would stand for one and the same substantial truth property. If this was the case, the plurality of names (" $F_1$ ", ..., " $F_n$ ", " $G$ ") employed in the formulation would be redundant. They would stand for the same sparse and substantial property denoted by the generic truth concept. Neutrality of formulation is thus reached at the cost of drawing possibly superfluous linguistic distinctions: a cost that is worth paying in this debate, in order not to beg the question, but whose rationale should be kept in mind. The final upshot is just that, despite the apparent appeal to a generic concept of truth, the semantic account of validity does not require a general substantial/sparse property of truth, but an abundant generic property at most.

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<sup>12</sup> Some authors have argued that deflationism does actually support explanations. Most recently, [Bradley \(2023\)](#) has defended the claim that the concept of (deflationary) truth can be explanatory even if its property is metaphysically disunified. Since what is at stake in this paper is precisely metaphysical unity, however, such a view does not seem to pose a particular problem. On deflationism and explanation see also ([Damjanovic, 2004](#); [Gamester, 2018](#)).

#### 4. The fragmentation of validity

As shown by SVC\*, and the discussion above, preservation of truth in single valid inferences does not require a unique sparse truth property. However, such uniqueness might still be implied by other features of logical validity. It could still be the case that the truth properties picked up by  $F_1, \dots, F_n, G$  must be identical for reasons other than truth preservation. Indeed, this, we argue, is exactly the case. To anticipate the main point, the reason why validity requires a single substantial property of truth is not that a single property must be transmitted from premises to conclusion, but that validity is a *uniform* property of different arguments.<sup>13</sup>

The issue of uniformity of validity can be quickly illustrated by the following examples. First, consider a simple two-line valid argument such as:

$A_1$ :  
 snow is white and two plus two equals four,  
*therefore*, two plus two equals four.

Suppose, as per truth pluralism, that the truth of the premise and the truth of the conclusion consist in different properties, say  $F_1$  and  $F_2$ .<sup>14</sup> Then, if validity consists in a necessary conditional instantiation of truth, the validity of this inference amounts to the following: *necessarily, if ‘snow is white and two plus two equals four’ is  $F_1$ , then ‘two plus two equals four’ is  $F_2$*  (Shapiro, 2011). As expected, no unique property of truth is forced upon us.

Consider then a second valid argument in which premise and conclusion are taken to bear different truth properties, say,  $F_3$  and  $F_4$  respectively. Suppose this other argument is<sup>15</sup>:

$A_2$ :  
 Monty Python is funny and vanilla is delicious,  
*therefore*, vanilla is delicious.

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<sup>13</sup> This is indeed consistent with most strong pluralist treatments.

<sup>14</sup> Of course, also concepts have properties and count as real in the mental realm, but the idea should be clear.

<sup>15</sup> The idea of allowing (atomic) propositions to belong to different domains (as in Cotnoir, 2013; Yu, 2017) is questionable from a truth pluralist point of view. However, for the sake of charity, we concede the point here

Clearly we can repeat the approach and account for the validity of this second argument as follows: *necessarily, if 'Monty Python is funny and vanilla is delicious' is  $F_3$ , then 'vanilla is delicious' is  $F_4$* . At first sight, again, nothing problematic seems to be here. No unique property of truth is required for the validity of this argument, even though truth preservation, correctly understood, is still involved. It then seems that neither the validity of  $A_1$  nor the validity of  $A_2$  call for a unique property of truth.

A puzzle emerges, however, the moment we wonder whether these two arguments exemplify the same property of logical validity. What is the validity of the first argument? It consists in the necessary conditional link between the instantiation of  $F_1$  and  $F_2$ . Such a property of validity, call it  $\text{Val}_1$ , amounts to the following: in any case in which the premise is  $F_1$  the conclusion is  $F_2$ . What is the validity of the second argument? It consists in the necessary conditional link between the instantiation of  $F_3$  and  $F_4$ . The validity of  $A_2$ , call it  $\text{Val}_2$ , amounts to the following: in any case in which the premise is  $F_3$  the conclusion is  $F_4$ . Are  $\text{Val}_1$  and  $\text{Val}_2$  the same property? Hardly so.  $\text{Val}_1$  concerns a structural relation between  $F_1$  and  $F_2$ , while  $\text{Val}_2$  concerns a structural relation between  $F_3$  and  $F_4$ . Since  $F_1$ ,  $F_2$ ,  $F_3$  and  $F_4$  are, by assumption, different properties,  $\text{Val}_1$  and  $\text{Val}_2$  are different properties as well.

To put the point vividly, consider properties other than truth. For example, consider a weird class of arguments in which the conclusion is funny in any case in which the premises are funny, and a class of arguments in which the conclusion has moral value in any case in which the premises have moral value. Accordingly, arguments in the former class preserve being funny, whereas arguments in the latter preserve moral value. Clearly, if being funny and having moral value are different, preservation of being funny and preservation of having moral value are also different properties. The arguments in the two classes are similar, at most, in the sense that they all preserve some properties. Since, however, the preserved properties are different, they are not more similar than arguments preserving length, falsity, or beauty. The situation is the same for logical validity. If the preserved truth properties are different, also the resulting properties of validity are different. Preserving  $F_1$  and preserving  $F_2$ , for example, is as disparate as preserving being funny, having moral value, or else.<sup>16</sup>

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<sup>16</sup> Such a move could be counteracted by insisting that the merely modal char-

Notice that the argument crucially hinges on the assumption that validity is defined in terms of truth.  $\text{Val}_1$  and  $\text{Val}_2$  are not merely structural relations with an intrinsic or arbitrarily defined nature. Rather, they are supposed to be specific *truth* dependencies. To see why this is relevant, an example is useful.<sup>17</sup> Consider the properties of physical height and of cardinality. Physical objects may be ordered according to their physical height and natural numbers may be ordered according to their cardinality. Call the former ordering  $\text{Ord}_1$  and the latter  $\text{Ord}_2$ . Are  $\text{Ord}_1$  and  $\text{Ord}_2$  the same relation? One may feel entitled to conclude so. After all,  $\text{Ord}_1$  and  $\text{Ord}_2$  can be seen as the result of particular applications of a more general ordering relation, that of *being larger than* ( $>$ ). It is then tempting to resist the fragmentation of validity by replicating this kind of reasoning also in the context of logic. However, the analogy breaks down quickly. If we ask what the relation of *being larger than* consists of, we can either explain it in terms of a general notion of quantity, of which physical height and cardinality are determinations, or we can take it as primitive, possibly captured by basic principles (irreflexivity, anti-symmetry, or else). With respect to  $>$  these options are not a source of particular problems, but if we try to transfer such approaches to validity, we immediately clash with some of the assumptions of our debate. If we take validity to be primitive or merely structural, rather than defined as truth preservation, then we illegitimately replace the assumed truth-theoretic account with another one (this is option 3 discussed below). If, similarly to the resort to quantity, we appeal to a general property keeping  $F_1$ ,  $F_2$ ,  $F_3$  and  $F_4$  together, we are dragged to a generic property of truth that, instead, we must avoid (this is option 1 discussed below). Insisting on structurality does not seem helpful.

An interesting consequence of the argument for fragmentation is that it leads to different properties of validity for any argument in which the relevant truth properties vary, even when a single one is preserved in each valid inference. If we consider a valid argument  $A_3$  in which the conclusion is  $F_1$  in any case premises are also  $F_1$ , and a valid argument  $A_4$  in which the conclusion is  $F_2$  in any case premises are also  $F_2$ , then the validity of the former is  $F_1$ -preservation, whereas the validity of the

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acterization of validity (without any resort to logical form) is also legitimate, and by limiting the scope of the paper to it. This move, however, is not necessary.

<sup>17</sup> Semantic considerations might be employed, at an epistemic level, to *determine* the extension of the right logical form, but metaphysically the logical form should come first, otherwise the metaphysical fragmentation would not be escaped.

latter is  $F_2$ -preservation. Again, since, by assumption,  $F_1$  and  $F_2$  are different properties, the resulting validities are also different. This shows that the problem of fragmentation and the initial problem of mixed inferences are different issues. In particular, we can have one without the other. For example, the arguments  $A_3$  and  $A_4$  are not mixed (a unique truth property is preserved in each), but they give rise to fragmentation nonetheless (their validity consists in preservation of different properties). By contrast, all arguments like  $A_3$  are mixed but, by themselves, they are uniform, because the validity of all arguments like  $A_3$  consists in one and the same thing: having the conclusion  $F_2$  in any case in which the premise is  $F_1$  (similarly for arguments like  $A_4$ ). Valid inferences of this kind are mixed but not fragmented, for they have the same property of validity. It follows that a solution to the problem of mixed inferences does not guarantee a solution also to fragmentation. Indeed, this is exactly the case of SVC/SVC\*, which, regardless of its ability to solve the problem of mixed inferences, is impotent to secure the uniformity of validity (Wright, 1992; Lynch, 2009).

These remarks can be generalised to every inference involving different combinations of truth properties, so that we easily end up with a proliferation of different properties of validity.<sup>18</sup> Clearly, such a fragmentation of logical validity would be avoided if a unique truth property were involved, and  $F_1, \dots, F_n, G$  were identical. If only one truth property  $T$  is preserved, then the validity of all valid inferences,  $A_1$  and  $A_2$  included, amounts to one and the same thing: the property consisting in necessarily having the conclusion  $T$  if the premises are  $T$ .

Is such a conclusion correct? One might object that even if  $\text{Val}_1$  and  $\text{Val}_2$  and the like are, in some sense, different properties of logical validity, they still have something important in common, which separate them from mere preservation of disparate properties. They are not completely alike and a fragmentation of validity is not obtained so easily. Therefore, before drawing general consequences of the fragmentation of validity, and assessing its significance, it is better to pause and see how such a conclusion could be resisted. In the next sections we discuss the main options to this end and argue that none of them works. For the moment, however, it should be noted that, on the one hand, such a fragmentation has passed so far unnoticed, so that acknowledging it

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<sup>18</sup> What the truth platitudes are is a matter of debate (see Pedersen and Wright, 2018).

contributes to a better understanding both of certain conceptions of truth and of their interaction with logical validity. On the other hand, the result has puzzling consequences with respect to issues in philosophy of logic, such as the identification of the subject matter of logic. Apparently, logic can be understood as the discipline inquiring about a certain unitary phenomenon, that of the validity of certain inferences. If validity is fragmented, however, this appearance is misleading. What we have are inferences with various properties, which are gathered together despite their disparate nature. If there is not a uniform property of validity, why do logicians study all sorts of valid arguments as if they formed a sparse/uniform phenomenon? Are they making a mistake, misled by the appearances due to a unique but superficial concept? Should they put the same effort in studying mixed preservation of properties like being funny or moral value? Are these worries tamed by espousing logical pluralism? (Spoiler: no. See Section 8 below.) No matter the answers, this kind of questions suggests that the issue has non-trivial consequences and already *prima facie* philosophical relevance. Before discussing other consequences, however, let us see if there are ways of blocking the argument.

### 5. Option 1: Truth

The most natural option to show that the above argument is untenable is that of pointing out that there is an obvious sense in which the properties preserved in logically valid arguments are uniform.  $F_1, \dots, F_n$  and  $G$  are not as disparate as being funny, being false, and so on. Indeed, in our reconstruction of validities (such as  $\text{Val}_1$  and  $\text{Val}_2$ ) we omitted the *truth* qualification that is explicit in  $\text{SVC}/\text{SVC}^*$ . After all, although  $F_1, \dots, F_n, G$  are different properties, they are all *truth* properties. It is because they are all *truth* properties that  $F_1, F_2, F_3$  and  $F_4$  are taken together. And it is because they are truth properties, that  $\text{Val}_1$  and  $\text{Val}_2$  are validities of the same kind. They are both arguments preserving *truth*. It is truth that characterises logical validity as a uniform property of valid arguments. The analogy between  $F_1/F_2$ -preservation and being funny/having moral value-preservation is then misguided.  $F_1$  and  $F_2$  are gathered together because they are truth properties, being funny and having moral values are not. Hence, since all valid arguments are, by definition, necessarily *truth* preserving, they all have one and the

same property of logical validity. The above argument for fragmentation seems just poor and obviously wrong.

Unfortunately, even if this reaction is natural, things are not so simple. Indeed, it is at this point that the long excursus above is crucial. To evaluate such a reply, we need to pay careful attention to the distinction between concepts and properties. When we stress that  $F_1, \dots, F_n$  and  $G$  are all *truth* properties, we can mean that they are uniform at a metaphysical level—so that they somehow correspond to a general sparse property—or that they are uniform at an epistemic level—so that they are all denoted by a single concept. As already argued, the former, metaphysical option leads to the introduction of a general substantial property of truth. Such a strategy, then, must be excluded here. If the goal is showing that logical validity does not require a unique substantial truth property, the only viable option is that what keeps  $F_1, \dots, F_n, G$  together is not a general substantial property of truth but merely a general concept of truth, with an insubstantial property attached. If uniformity is regulated at the level of the truth concept, however, the argument for fragmentation goes through as before: different properties are preserved, so that different properties of validity are obtained. At most, we can say that there is one concept of general logical validity, characterised by  $SVC^*$ , which obtains its unity from the concept of truth.  $SVC^*$  would then play a role for the concept of validity similar to the one played by truisms with regard to the concept of truth. Given the distinction and gap between concepts and properties, however, having a uniform *concept* of validity is not enough to support a uniform *property* of validity. As a unique concept of truth does not force the postulation of a substantial/sparse property of truth, so a unitary general formulation like  $SVC^*$  does not guarantee also a unitary general property of logical validity.  $SVC^*$  can provide a unitary concept of validity, but whether such a concept also carves the collection of arguments at its joints is a different issue. Indeed, the above argument shows that the metaphysical fragmentation of truth also implies a metaphysical fragmentation of validity. As a result, pointing to the conceptual unity, possibly displayed by the formulation of  $SVC^*$ , is not enough to secure a uniform property of validity.  $SVC^*$  might seem to identify a unique property, but its seeming unity would mostly be an artefact of the formulation. In other words, if the concept of truth is the glue keeping together the various validities, then merely a uniform concept, not a uniform property of validity, is yielded. Note also that, in the present context, having a

uniform concept of validity would not make much difference. It is metaphysical fragmentation, regardless of conceptual unity, that is a source of philosophical puzzles, exactly like a plurality of properties, despite the unitary concept, makes strong truth pluralism an interesting but often problematic view.

To support metaphysical unity, SVC\* must be supplemented with considerations showing that the notion of validity so defined is not merely conceptually unitary, but it captures a metaphysical uniformity. This metaphysical uniformity, however, cannot be conferred by a truth property, which is disunified. To obtain a uniform property of validity we would need a general sparse property of truth, but this is exactly what we are trying to avoid. Natural as it may be, the first option does not work. If the metaphysical fragmentation of validity is to be avoided, other strategies must be found.

## 6. Option 2: Logical form

A second option to resist the potential fragmentation of logical validity while avoiding a general and substantial property of truth could be that of invoking logical form.<sup>19</sup> After all, it could be pointed out that in SVC\* something important is missing, namely that valid arguments preserve truth in virtue of logical form. By relying on logical form, the sparseness of logical validity could perhaps be recovered. This strategy can be implemented by following two routes, which are discussed below.

Firstly, to take advantage of formality, (atomic) propositions could be allowed to receive any area-specific truth property under different evaluations, regardless of their supposed domain.<sup>20</sup> The hope would be that, by cutting the link between propositions with their specific domains and truth properties, premises and conclusions would stop being true only in specific ways. Such interpretations, covering all possible cases, would indeed present a maximally varied distribution of truth properties. Accordingly, each argument should always be evaluated with respect to all truth properties and thus uniformity regained. Although the exact details depend on how the semantics is implemented, and an accurate

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<sup>19</sup> Some authors, such as [Ferrari and Moruzzi \(2019, 2020\)](#), also allow insubstantial (deflationary) area-specific truth properties.

<sup>20</sup> Thanks to a referee for this journal for stressing this issue and proposing the example.



discussion would take too much space, the main problem of this strategy is general and can be briefly put as follows. Since every argument is associated with a set of different interpretations, if the argument is valid and validity is substantial, the property of having the conclusion true if the premises are true should carve the set of those obtained interpretations at its joints. It is exactly that, however, that is not possible. As the argument for fragmentations has shown, the moment different specific truth properties are assigned to premises and conclusion, no attribute agreement is exhibited unless a substantial property of truth is admitted. Having a conclusion true if the premises are true is at most an abundant property of the interpretations of an argument. In other words, in the effort to solve the problem of fragmentation by resorting to logical form and making the evaluations range on all truth properties, the abundance of validity is just moved to the interpretation level.

Alternatively, one could try to avoid such an outcome by stressing the role of logical form in another way. It could be pointed out that what is missing so far is that a valid argument necessarily preserves truth *in virtue of* its logical form. The uniformity of logical validity could then be obtained by the uniformity of the ground of truth preservation: namely having a logical form of a certain kind. According to this option, logical form is what determines a uniform set of arguments (the logically valid ones), which also have the -possibly abundant- property of truth preservation. Namely, logical validity could be a property corresponding directly to a uniform kind of logical forms, whose nature is independent of truth.<sup>21</sup> For example, the right kind of logical form might consist in a certain syntactically defined property. This strategy, however, does not seem very promising. First of all, different valid arguments instantiate different forms, so what is the one grounding validity? More likely, there is a collection of valid forms. If so, however, we have just moved the problem, since now we have to explain what keeps those forms together

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<sup>21</sup> For the sake of clarity, it is worth noting that SVC/SVC\* does *not* solve the problem of mixed inferences by resorting to the concept of truth and by holding that such a concept can be applied to all true sentences. Rather, SVC is intended to show that there is no need for a unique property to be preserved, so that a unique concept is only serving expressing purposes at most. The solution uses but does not hinges on a unitary truth. The solution is rather given by stressing the role of truth dependencies. That the appeal to a general concept of truth is not enough to solve the problem of mixed inferences is generally accepted as an established point in the debate (see, e.g., Pedersen, 2006; Wright, 2013).

into a unitary feature to which the supposed unitary validity consists in. Certainly, we cannot say that those forms are the ones that are necessarily truth preserving, because we know that a fragmented truth is incapable of providing such a unification. This means that what keeps the forms together must be something else. This move then leads to the next option.

### 7. Option 3: Alternative accounts

A third option is that of looking directly for a property other than truth to keep all various validity properties (or the valid forms) together. Valid arguments must exhibit a uniform way of being valid that grounds specific validities, without essentially relying on a truth property.<sup>22</sup> Non truth-theoretic accounts of validity are not hard to find. Well known options include, for instance, a proof-theoretic account -which is the main alternative to a semantic one-, a game-theoretic one, and a primitivist one among several others. According to a proof-theoretic approach, for instance, the validity of an argument consists in having a conclusion provable from its premises in a certain proof system (or better, its canonical translation in a formal language can be derived in a specific proof system). We thus have that all valid arguments are valid in the same sense and have the same property of validity. Uniformity of logical validity is achieved. Particularly, since the notion of generic truth does not arguably play any explanatory role in a proof-theoretic account of validity (with expressive roles still permitted), then no substantial/sparse property of truth is needed. It then seems that we have everything we are looking for: Logical validity is a uniform, sparse property without requiring a general substantial property of truth.

This radical move too, however, suffers from immediate difficulties. The main problem is that, with such a strategy, validity does no longer consist in necessary truth preservation. Indeed, according to the alternative accounts, validity, as a property, is something else, like provability. If so, the initial assumption, namely that validity is necessary truth preservation, has just been abandoned. Far from being a solution, the move is a non-starter. Moreover, besides being a non permitted move in this context, the result would also be unsurprising. After all, the upshot

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<sup>22</sup> This is not to say that it is impossible to solve both problems in a unique way. Examples could be those explored in (Stollo, 2017, 2022b,c).

of this strategy is just that if validity is not truth preservation, a general substantial property of truth is not required. But this is hardly unexpected. Accounts that are non-truth-theoretic are clearly not expected to be committed to a substantial property of truth. The opposite would be remarkable. Finally, the same argument could also be replicated for other alternative accounts, such as a game-theoretic or a primitivist one.

Since, at this point, we apparently run out of natural options, we can advance the conclusion that if logical validity is necessary truth preservation, and validity is a uniform property of arguments, then a general substantial property of truth is required. Such a general property is not imposed by truth preservation -as usually thought- but to ground uniformity. Attempts to safeguard the uniformity of validity while avoiding a general property of truth are bound to fail. Let me repeat the main key points. If uniformity is rescued by the idea that all preserved properties are *truth* properties -by invoking truth platitudes for example- the only way to avoid an automatic commitment to a general substantial truth property is that of pivoting on a general truth concept. If the key role is played by a concept, however, the obtained uniformity of validity is only conceptual and it is not enough to guarantee a uniform property of validity. The situation does not change much if logical form is invoked. The resort to logical form either moves the abundance of validity at the level of interpretations, or, alternatively, invites an account of the uniformity of validity not in terms of truth. The latter option, in turn, can only be pursued at the price of abandoning the assumed account of logical validity as truth preservation.

## 8. Consequences and remarks

The above discussion on the fragmentation of validity and the failed attempts to vindicate its uniformity mostly assumed strong truth pluralism as the theoretical background. Similar consequences, however, also extend to a deflationist conception, which holds that no sparse property of truth is to be admitted, neither generic nor area-specific. According to deflationism, the role of truth in the characterization of validity is that of a merely expressive device shortening a very long conjunction. Beside this, there is no need to mention truth at all, since the area-specific truth properties of truth pluralism are also rejected. We thus have that, in a deflationist approach, each valid argument has its

own property of validity, formulated directly in terms of premises and conclusion without semantic ascent. For example,  $Val_1$  consists now in the fact that *necessarily, if snow is white and two plus two equals four, then two plus two equals four*. Analogously, the property of validity  $Val_2$  is that *necessarily, if Monty Python is funny and vanilla is delicious, then vanilla is delicious*. By usual deflationary means, such conditionals (and a host of similar ones) can be gathered together by saying that in a valid argument, necessarily, if the premises are (deflationarily) true, the conclusion is (deflationarily) true. Clearly, also according to this approach,  $A_1$  and  $A_2$  have different properties of validity, and so does any other valid argument involving different premises and conclusions. If in a strong pluralist setting we have groups of arguments having the same property of validity (when the area specific truth properties involved are the same), in a deflationist approach each argument has a different specific property of validity. The fragmentation of the property of validity is then complete. It follows that also in a deflationist conception the uniformity of logical validity, understood as truth preservation, is lost. We can indeed repeat the question: In what sense, if any, are the valid arguments valid in the same way, since they exhibit properties of validity consisting of different things? To answer this question, the same options discussed above would suggest themselves: resorting to truth, invoking logical form, or turning to alternative accounts. The same problems would also re-emerge.

Granted that the outcome is the same for any position not admitting a general substantial/sparse property of truth, and thus affects both strong pluralism and deflationism, the consequences would nonetheless be less serious for deflationism. The reason is that, while a strong pluralist typically motivates her position by advertising the ability to keep the explanatory strength of traditional conceptions of truth, a deflationist is eager to dispense with any truth-theoretic explanation. Accordingly, if the above results are taken to show that an account of logical validity as necessary truth preservation is incompatible with strong pluralism or deflationism, the news will be met with different reactions. The strong pluralists face a worrying puzzle, since renouncing a truth-theoretic explanation makes their position more similar to deflationism than to traditional theories. If so, the putative advantage of a (strong) pluralist conception diminishes, and the result represents an unexpected theoretical cost. For the deflationists, instead, the landscape does not change much. Given the deflationist effort to avoid any truth-theoretic

explanation, that logical validity should also be treated in an alternative way is a requirement that naturally fits the original plan. Required or not, a deflationist does not want to use truth as an explanatory resource. It is the strong pluralist who still has the ambition to do that. In particular a deflationist could turn the argument above on its head, taking it to show that since there is not a substantial property of truth, logical validity cannot be necessary truth preservation, otherwise it would be severely fragmented. Accordingly, its metaphysics is to be accounted for in different, possibly non-semantic terms, adopting, for instance, a syntactic or a proof-theoretic approach. In other words, a deflationist is willing to take a *modus tollens* reaction and reject the initial assumption that validity is necessary truth preservation. A deflationist could even extend her approach to validity itself, admitting that only an insubstantial, abundant property of validity is there.<sup>23</sup>

If a deflationist might easily abandon a metaphysical truth-theoretic account of validity, one could wonder whether strong pluralism could not be squared with the above results in a similar fashion. For example, if renouncing a general property of truth leads to a fragmentation of logical validity, then so much the worse for its uniformity. Could not the strong pluralist just accept the outcome, registering that a plurality of validity properties must parallel the plurality of truth properties? Recent works on logical pluralism and the increasing numbers of authors sympathetic to it seem to make the option less costly than it might have appeared. After all, why should one think that logical validity is a uniform property in the first place? Authors such as [Beall and Restal \(2006\)](#)<sup>24</sup>, for instance, have extensively argued that logical validity comes in many forms. Teamed with logical pluralism, a strong pluralist could then bite the bullet and just accept the proliferation of validity properties.

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<sup>23</sup> One could object that properties such as having moral value or being funny are out of place, since they are not the right kind of properties. But what is the right kind of property here? One possibility, discussed in the next section, is that the preserved properties must be truth properties. Another option is that they must be epistemically valuable properties. This would provide a preservationist view of logical validity in a broader sense, according to which logical validity is preservation of epistemically valuable properties, such as truth, justification, information, evidence, and so on. The problem with this option is that it replaces the view of validity as truth preservation with something else. Thus, it is a variant of option 3, discussed below.

<sup>24</sup> The concept could be constitutive of other cognitive resources, such as constituting belief (see, e.g., [Strollo, 2020](#)).

The problem with this reaction is that teaming up with logical pluralism cannot be completely unconstrained, given that strong truth pluralism needs logical pluralism in a precise form. The required logical pluralism is one for which there is a plurality of properties of validity of a specific kind, like  $\text{Val}_1, \text{Val}_2$ , and so on. Since no logical pluralism currently on the market has proposed anything close to that, especially independently of truth pluralism, the required form of logical pluralism would not meet the original needs of logical pluralism (Pedersen, 2014). In particular, the obtained plurality of validity properties is not arguably connected to the plurality of logics usually favoured by logical pluralists. For example, what combination of truth properties would yield the validity property corresponding to relevant logic? Strong pluralism would be forced to embrace a deviant and articulated stance on issues that do not have independent motivations in philosophy of logic. In other words, from the perspective of logic, it does not seem correct to draw the distinctions among the properties of validity posed by the strong pluralism as an effect of fragmentation. Since strong pluralism seems to be committed to a precise, uncommon form of logical pluralism, the combination is possible, but it is not clear how much water logical pluralism can really bring to the pluralist mill in this context.

## 9. Conclusion

In this paper we have argued that logical validity, understood as necessary truth preservation, requires a general substantial/sparse property of truth. First, we have followed recent proposals to unpack the metaphor of truth preservation (SVC), stressing that it amounts to structural relations among instantiations of truth properties, no matter how many truth properties are involved. Then we showed that to avoid a commitment to a generic truth property, we should be very careful with the role of the concept of truth (leading to SVC\*) and the attached metaphysics of truth. By elaborating on themes from deflationism and strong pluralism, we argued that the idea of truth preservation does not require a general substantial property of truth. This does not mean, however, that logical validity does not require such a property. Indeed, we argued that another apparent feature of validity -its uniformity- does carry such a commitment. If there is not a generic property of truth, but only a plurality of specific truth properties, then logical validity is

fragmented as well. A plurality of specific validity properties, instead of a general validity property, is obtained. The main strategies to fix this (resorting to truth, to logical form, or to alternative accounts) all fail. If logical validity is necessary truth preservation, the only way to secure its uniformity is that of resorting to a unique substantial property of truth keeping all the derived validity properties together.

We then argued that such a result is not very costly for deflationism, but more problematic for strong pluralism. We thus discussed the possibility for strong pluralism of just accepting the ensuing fragmentation of validity. To support such a move, strong pluralism could team up with logical pluralism holding that the uniformity of validity is a wrong assumption in the first place. Such a move, however, would be problematic, since the logical pluralism needed turns out to be of a particular kind, hardly motivated by independent reasons.

Independently of its potential cost, showing that renouncing a general property of truth leads to a fragmentation of validity puts the focus on a feature of logical validity — its uniformity — that must be taken into account and that, instead, has been so far neglected. Reconstructions such as those in SVC give the impression that the philosophy of truth and the foundation of logic are two independent issues to a great extent. The above discussion contributes to show that this is not the case.

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