

Chapter 6

From Grounding to Truth-Making: Some Thoughts

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Abstract The number of writings on truth-making which have been published since Kevin Mulligan, Peter Simons and Barry Smith's seminal, rich and deep article 'Truth-Makers' in 1984 is considerable. Some deal with the theory of the notion, some with its applications and some with both. This chapter adds up to the pile of writings which focus on the theory. I focus on one account of truth-making I find plausible, the view that for a truth-bearer to be made true by an entity is for it to be the case that the truth-bearer is true because the entity exists, where 'because' is understood as expressing a form of objective, metaphysical explanation which is now often subsumed under the label 'grounding'. Taking this account for granted, we may distinguish, amongst the general principles governing truth-making, those which derive from more basic principles governing the notions in terms of which it is defined, from those which do not. Which principles compose the first class, which are the more basic principles from which they derive and how do the former derive from the latter? I try to make some steps towards an answer to this difficult question.

Keywords Truth · Truth-making · Metaphysical explanation · Grounding

The number of writings on truth-making which have been published since Kevin Mulligan, Peter Simons and Barry Smith's seminal, rich and deep article 'Truth-Makers' in 1984 is considerable. Some deal with the theory of the notion, some with its applications and some with both. This chapter adds up to the pile of writings which focus on the theory.

A common *informal* explanation of what truth-making is runs as follows: To say that an entity makes a truth-bearer (sentence, proposition, etc.) true is to say that the truth-bearer is true *in virtue of* the fact that the entity exists. When it comes to official or formal explanations, though, voices diverge. The view I wish to focus on here is that 'in virtue of' talk should be taken seriously rather than as a mere *façon de parler*. More precisely, the view is that for a truth-bearer to be made true by an entity is for it to be the case that the truth-bearer is true *because* the entity exists, where 'because' is understood as expressing a form of objective, metaphysical

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explanation which is now often subsumed under the label ‘grounding’.¹ Although I find this account plausible, I will not try to defend it here but simply assume that it is correct. (See Mulligan 2007 for an interesting discussion on whether the account should be accepted.)

Taking the account for granted, we may distinguish, amongst the general principles governing truth-making, those which derive from more basic principles governing the notions in terms of which it is defined—namely grounding, truth and existence—from those which do not. The question I am interested in here is the following: Which principles compose the first class, which are the more basic principles about grounding, truth and existence from which they derive and how do the former derive from the latter?

I am far from having a complete answer to this question, in great part because I am not clear on the question which principles characterise the interaction between grounding and the logical constants on one hand and grounding and truth on the other hand. In this short chapter, I nevertheless try to make some steps towards an answer.²

6.1 Logical Form

I will take the logical form of simple truth-making statements to be:

(a) X make it true that ϕ ,

where ‘ X ’ is a list of one or more singular terms and ‘ ϕ ’ a sentence, and that of simple grounding statements to be:

(b) ϕ because Δ ,

where ‘ ϕ ’ is a sentence and ‘ Δ ’ a list of one or more sentences. I will henceforth abbreviate (a) to:

$$X \models \phi$$

¹ On grounding, see e.g. Fine (2001), Correia (2005, Chap. 3), Rosen (2010) and Fine (2012). One could also add Schnieder (2006a and 2006b), although the notion of explanation presented there is conceptual rather than metaphysical. An early friend of grounding, who did a lot to clarify the notion, is Bolzano (1973). The proposed account of truth-making appears in Correia (2005, § 3.2) and Schnieder (2006b).

² Given the size of the literature on truth-making and the scope of this chapter, I will largely omit to make reference to relevant papers on truth-making. The reader may consult Rodríguez-Pereyra (2006) and Rami (2009) for useful overviews and references.

and (b) to:

$$\Delta \triangleleft \phi.$$

These takes on the logical form of truth-making and grounding statements are by no means uncontroversial. I take it that several objects can jointly make something true without there being an object doing the work alone. Hence, the decision of allowing ‘ X ’ in (a) to be a list of more than one singular term. Some would object that whenever several entities seemingly make something true, what does the truth-making is really the mereological fusion of these entities. Yet, such a view commits one to all sorts of weird fusions of heterogeneous objects, the existence of which I prefer to stay neutral on. Similarly, I take it that several truths can jointly ground a given truth. Some would object that in the relevant cases, it is the conjunction of the grounds that does the grounding. I disagree. I want to say, for instance, that (at least in some cases) a true conjunction is grounded in its conjuncts. But a true conjunction cannot be grounded in itself, since grounding is irreflexive.

There is a variant on (a), which is actually more standard, that can be formulated as follows:

(a’) X make p true,

where ‘ p ’ is a term for a truth-bearer (say a sentence or a proposition). There are also variants on (b) which involve talk about facts, for instance:

(b’) The fact that ϕ is grounded in the fact that ϕ_1 , the fact that ϕ_2 , ...

A disadvantage of this mode of formulation is that it commits one to an ontology of facts, even presumably to a rich ontology of that kind, which is not to the taste of many. One might prefer a variant on (b’) where talk about facts is replaced by talk of propositions or sentences. I will completely leave aside these alternative modes of formulation, although I believe that (a’) and (b’)—at least those variants which involve talk about sentences rather than propositions or facts—are meaningful.

A last remark concerns the possibility that something be made true by infinitely many objects, and the corresponding possibility that something be grounded in infinitely many truths.³ If we stick to forms (a) and (b), we will be able take care of such cases only if we countenance infinite lists of singular terms and infinite lists of sentential expressions. This may be considered problematic. In order to avoid the problem in the case of truth-making, one may hold that the logical form of simple truth-making statements is (a) but with ‘ X ’ as a plural term, where ‘plural term’ not only covers finite lists of one or more singular terms but also definite expressions like ‘the natural numbers’ and ‘the space–time points’. But such a move is not available in the case of grounding, since what is on the right of ‘because’ in (b) is not

³ Here as in several other places, for stylistic reasons I allow myself to talk about truth-making and grounding by using predicational forms like (a’) and (b’).

a list of terms for entities but a list of sentences. In this respect, the predicational mode of formulation illustrated by (b') is superior, since there the move is available. One may thus after all have to go for such a mode of formulation. I will leave this issue aside here and simply work with (a) and (b).

Let us turn now to the precise formulation of the account of truth-making in terms of grounding. Where ' X ' is a list of one or more singular terms ' a_1, a_2, \dots ', let ' $E!X$ ' be the list of sentences ' a_1 exists, a_2 exists, ...'. Let ' T ' stand for the truth-operator 'it is true that'. The account runs as follows:

$$\text{Df. } X \vDash \phi \text{ iff}_{df} E!X \triangleleft T\phi.$$

That is to say, in more informal (and literally inappropriate) terms: for a_1, a_2, \dots to make ϕ true is for the truth of ϕ to be grounded in the existence of a_1, a_2, \dots .

6.2 Structural Principles

Following common vocabulary used in proof theory, I divide the principles about truth-making to be discussed into the *structural principles* and the *logical principles*. A principle for truth-making is structural if it is not about the interaction between truth-making and the logical constants, and logical if it is about this interaction. I also divide the principles about grounding to be discussed into structural and logical, in the same manner. This characterisation of the distinction is not very precise, but the reader will certainly grasp what I have in mind by reading the examples I provide below.

The following structural principles for grounding are fairly plausible (where ' Δ ' is a list of more than one sentence, ' $\wedge\Delta$ ' is any conjunction of these sentences, and if ' Δ ' is a 'list' of one sentence, ' $\wedge\Delta$ ' is the sentence itself; ' \square ' stands for 'it is metaphysically necessary that'; see Correia 2005, § 3.3, Correia 2010 and Fine 2012):

Structural principles for grounding:

- | | |
|--|---------------------------|
| g1. If $\Delta \triangleright \phi$, then $\wedge \Delta$ and ϕ | <i>Factivity</i> |
| g2. If $\Delta \triangleright \phi$, then $\square(\wedge\Delta \rightarrow \Delta \triangleright \phi)$ | <i>Rigidity</i> |
| g3. If $\Delta \triangleright \phi$, then $\square(\wedge\Delta \rightarrow \phi)$ | <i>Necessitarianism</i> |
| g4. If $\Delta, \psi \triangleright \phi$ and $\Lambda \triangleright \psi$, then $\Delta, \Lambda \triangleright \phi$ | <i>Cut (Transitivity)</i> |
| g5. Not: $\Delta, \phi \triangleleft \phi$. | <i>Irreflexivity</i> |

(In g4 and g5, ' Δ ' may be empty).

Notice that granted that Factivity holds of necessity, Necessitarianism follows from Rigidity. The following structural principles for truth-making are also fairly plausible:

Structural principles for truth-making:

- t1. If $X \models \phi$, then $\wedge E!X$ and $T\phi$ *Factivity*
- t2. If $X \models \phi$, then $\Box(\wedge E!X \rightarrow X \models \phi)$ *Rigidity*
- t3. If $X \models \phi$, then $\Box(\wedge E!X \rightarrow T\phi)$. *Necessitarianism*

It is easy to see that given Df, t1 follows from g1, t2 from g2 and t3 from g3.

Consider the following structural principle for truth-making often called ‘Entailment Thesis’:

If $X \models \phi$ and $\phi \Rightarrow \psi$, then $X \models \psi$, *Entailment Thesis*

where ‘ \Rightarrow ’ stands for entailment. One may actually understand ‘entailment’ in different ways. On one view, entailment is strict implication, i.e. ‘ $\phi \Rightarrow \psi$ ’ is to be understood as ‘necessarily, either ϕ or not: ψ ’, where ‘necessarily’ expresses meta-physical, conceptual or logical necessity. On this understanding of ‘entailment’ the Entailment Thesis is implausible, for a reason which has often been mentioned in the literature: Since every necessary truth is strictly implied by every truth, the Entailment Thesis, so understood, implies that every truth-maker makes every necessary truth true—which is an implausible view. But there is a more general objection to the thesis. In any reasonable sense of ‘entailment’, conjunctions entail their conjuncts. A consequence of the Entailment Thesis is thus that whenever some objects make a conjunction true, they make each of its conjuncts true. Yet, granted that, say, Socrates makes it true that he exists and Plato makes it true that he exists, it is plausible to hold that Socrates and Plato together make it true that Socrates exists and Plato exists. But one may deny that, say, Socrates and Plato together make it true that Socrates exists, on the grounds that Plato plays no role in making it true that Socrates exists.

Yet a similar principle, which does not face these difficulties, can be shown to follow from g4 given Df:

t4. If $X \models \phi$ and $T\phi \triangleright T\psi$, then $X \models \psi$. *Grounding Thesis*

This principle escapes the previous difficulties since (i) it is arguably not the case that every necessary truth has its truth grounded in the truth of any truth whatsoever, and (ii) it is arguably not the case that the truth of a conjunction grounds the truth of its conjuncts.

Consider:

t5. If $X, y \models \phi$ and $E!Y \triangleright E!y$, then $X, Y \models \phi$ *Grounding Thesis**

(where ‘X’ may be empty). Taking Df granted, it is easily shown that t5 follows from g4. This principle sounds just right.

6.3 Logical Principles I: Conceptualism

The previous discussion about structural principles was easy. When it turns to logical principles, things become more complicated, in part because there are several distinct conceptions of grounding which have some plausibility (see Correia 2010).⁴

Consider the following plausible logical principles for truth-making:

Logical principles for truth-making:

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|------|---|---------------------------------|
| lt1. | If $X \models \phi$ and $Y \models \psi$, then $X, Y \models \phi \wedge \psi$ | <i>Conjunction Introduction</i> |
| lt2. | If $X \models \phi$ or $X \models \psi$, then $X \models \phi \vee \psi$ | <i>Disjunction Introduction</i> |
| lt3. | If $X \models F(a)$, then $X \models \exists xF(x)$. | <i>Existential Introduction</i> |

Similar logical principles for grounding, which I dub *conceptualist*, are advocated by Kit Fine (forthcoming; see also Correia 2005, § 3.1):⁵

Conceptualist logical principles for grounding:

- | | | |
|------|--|---------------------------------|
| Lg1. | If ϕ and ψ , then $\phi, \psi \triangleright \phi \wedge \psi$ | <i>Conjunction Introduction</i> |
| Lg2. | If ϕ , then $\phi \triangleright \phi \wedge \psi$ | <i>Disjunction Introduction</i> |
| | If ψ , then $\psi \triangleright \phi \wedge \psi$ | |
| Lg3. | If $F(a)$, then $F(a) \triangleright \exists xF(x)$. | <i>Existential Introduction</i> |

Despite the similarity, the logical principles for truth-making cannot be derived from the conceptualist principles for grounding unless some principles connecting grounding and truth are added.

I suggest the adoption of the following principles I dub *strong semantic*:

Strong semantic principles for grounding:

- | | | |
|------|---|---------------------------------|
| Sg1. | If $T\phi$ and $T\psi$, then $T\phi \wedge T\psi \triangleright T(\phi \wedge \psi)$ | <i>Conjunction Introduction</i> |
| Sg2. | If $T\phi$ or $T\psi$, then $T\phi \vee T\psi \triangleright T(\phi \wedge \psi)$ | <i>Disjunction Introduction</i> |
| Sg3. | If $TF(a)$, then $\exists xTF(x) \triangleright T\exists xF(x)$. | <i>Existential Introduction</i> |

The standard truth-clause for conjunction states that a conjunction is true if and only if its conjuncts are both true. It is natural to view the right-to-left direction of this equivalence as holding in virtue of Sg1, the other direction being a mere case of entailment. Similar considerations hold of disjunction and Sg2 and existential quantification and Sg3.

⁴ The distinction between these conceptions will be made explicit in this section and Sect. 5.

⁵ I should say that Fine actually works with a weaker version of Existential Introduction, where ' $F(a)$ ' is replaced by ' $F(a)$ and a exists'. I shall ignore this nicety.

The following weak semantic principles also suggest themselves:

Weak semantic principles for grounding:

- Sg1. If $T\phi$ and $T\psi$, then $T\phi, T\psi \triangleright T(\phi \wedge \psi)$ *Conjunction Introduction*
 Sg2. If $T\phi$, then $T\phi \triangleright T(\phi \vee \psi)$ *Disjunction Introduction*
 If $T\psi$, then $T\psi \triangleleft T(\phi \vee \psi)$
 Sg3. If $TF(a)$, then $TF(a) \triangleright T\exists xF(x)$. *Existential Introduction*

Yet the weak semantic principles follow from the strong ones given conceptualism: For $i \in \{1,2,3\}$, sg_i follows from Sg_i , Lg_i and Cut.

Given Df, principles lt1–lt3 follow from the weak semantic principles: For $i \in \{1,2,3\}$, lt_i follows from sg_i , Factivity (for grounding) and Cut. These facts are summed up in Fig. 6.1.

6.4 Logical Principles II: Conceptualism and Necessitation

Consider the following further semantic principle:

- Sg5. If $\Delta \triangleright \phi$, then $T\Delta \triangleright T\phi$. *Necessitation*

(‘ $T\Delta$ ’ is the list obtained from ‘ Δ ’ by prefixing each sentence with ‘ T ’.) It has some plausibility and is particularly powerful given the conceptualist principles and the Tarskian principle:

- If $T\phi$, then ϕ . *Tarski \rightarrow*

In fact, it allows to directly derive the weak semantic principles: For $i \in \{1,2,3\}$, sg_i follows from Lg_i , Necessitation and Tarski \rightarrow . The situation is summed up in Fig. 6.2.

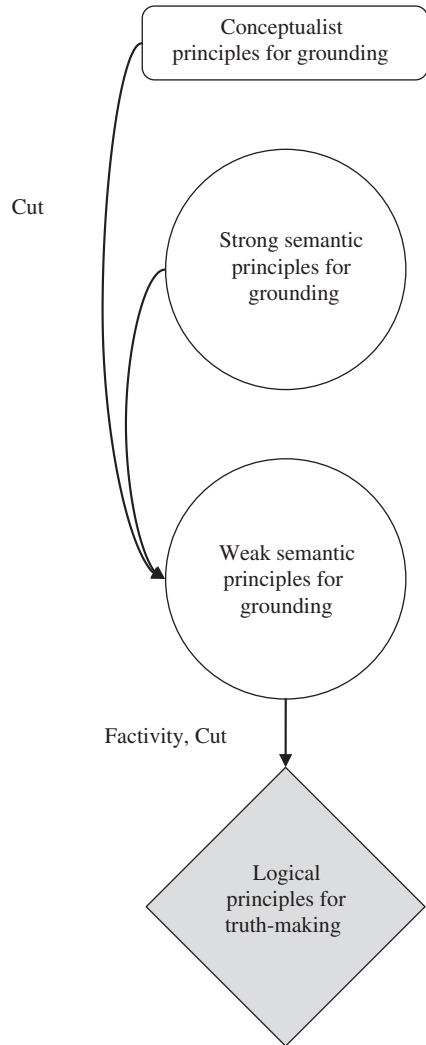
Notice that Necessitation also allows one to derive, together with Cut, a strengthened version of the structural Grounding Principle t4, namely:

- t6. If $X \vDash \phi$ and $\phi \triangleright \psi$, then $X \vDash \psi$. *Strengthened Grounding Thesis*

6.5 Logical Principles III: Neutralism

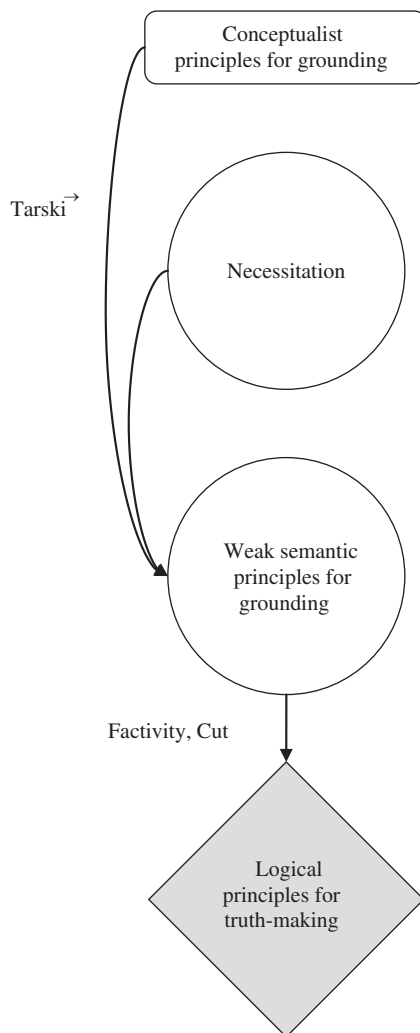
Conceptualism involves a conception of grounding as very fine grained. In fact, given conceptualism, if ϕ holds, then it grounds both $\phi \wedge \phi$ and $\phi \vee \phi$. In Correia (2010), I argued against such fine-grained conceptions on the grounds that ϕ , $\phi \wedge \phi$ and $\phi \vee \phi$

Fig. 6.1 From grounding to truth-making: Logical principles I



are all factually equivalent, in the sense that they all capture the same aspect of reality. The argument was to the effect that, granted that grounding is supposed to ‘carve reality at the joints’, ϕ can ground neither $\phi \wedge \phi$ nor $\phi \vee \phi$. I then put forward a ‘worldly’ conception of grounding and factual equivalence, which countenances only restricted versions of Lg1 and Lg2.

Fig. 6.2 From grounding to truth-making: Logical principles II



I now tend to think that there is room for both conceptualist and worldly notions of grounding, although I am not clear on how they are related.⁶ Be it as it may, in this section, I examine the prospects of getting the same results as earlier but without assuming the conceptualist principles.

⁶ I am tempted by the thought that there is a basic conceptualist notion in terms of which worldly notions can be defined by restriction.

The prospects are good. Consider the following logical principles for grounding I dub *neutral*:

Neutral logical principles for grounding:

$\text{lg}1^+$. If $\Delta \triangleright \phi$ and $\Lambda \triangleright \psi$, then $\Delta, \Lambda \triangleright \phi \wedge \psi$	<i>Conjunction Introduction</i>
$\text{lg}1^-$. If $\Delta, \psi \wedge \varrho \triangleright \phi$, then $\Delta, \psi, \varrho \triangleright \phi$	<i>Conjunction Elimination</i>
$\text{lg}2^+$. If $\Delta \triangleright \phi$ or $\Delta \triangleright \psi$, then $\Delta \triangleright \phi \vee \psi$	<i>Disjunction Introduction</i>
$\text{lg}2^-$. If $\Delta, \psi \wedge \varrho \triangleright \phi$ and ψ , then $\Delta, \psi \triangleright \phi$	<i>Disjunction Elimination</i>
	If $\Delta, \psi \wedge \varrho \triangleright \phi$ and ϱ , then $\Delta, \varrho \triangleright \phi$
$\text{lg}3^+$. If $\Delta \triangleright F(a)$, then $\Delta \triangleright \exists xF(x)$	<i>Existential Introduction</i>
$\text{lg}3^-$. If $\Delta, \exists xF(x) \triangleright \phi$ and $F(a)$, then $\Delta, F(a) \triangleright \phi$.	<i>Existential Elimination</i>

Plausibly, they are acceptable by both conceptualists and non-conceptualists—actually, they are derivable from the postulates put forward for worldly grounding in Correia (2010)—and they follow from the conceptualist principles: For $i \in \{1,2,3\}$, $\text{lg}i^+$ and $\text{lg}i^-$ follow from Lgi , Factivity and Cut.

The weak semantic principles follow from the strong ones and the neutral principles: For $i \in \{1,2,3\}$, sgi follows from Sgi and $\text{lg}i^-$. So given the neutral principles, we can get $\text{lt}1$ – $\text{lt}3$ in the same way as before. Interestingly, only the *elimination* principles are at work there, but there is another route to $\text{lt}1$ – $\text{lt}3$, via the *introduction* principles: For $i \in \{1,2,3\}$, $\text{lt}i$ follows from Sgi , $\text{lg}i^+$, Factivity and Cut. These facts are summed up in Fig. 6.3.

6.6 Aristotle

Aristotle (*Metaphysics*, 1051b 6–8, 1991) put forward a principle which can be read as comprising a further semantic principle about grounding:

It is not because we think that you *are* white, that you are white, but because you are white we who say this have the truth.

The semantic principle states that truths ground their truth:⁷

$\text{Sg}6$. If ϕ , then $\phi \triangleright T\phi$. *Aristotle*

The principle is plausible, and it allows one to derive principles which are themselves plausible. Given this principle, we can directly derive:

$\text{t}7$. If $E!x$, then $x \models E!x$,

⁷ Schnieder (2006b) uses this principle in the context of truth-making theory in order to argue against the popular view that certain entities like tropes can play the role of truth-makers.

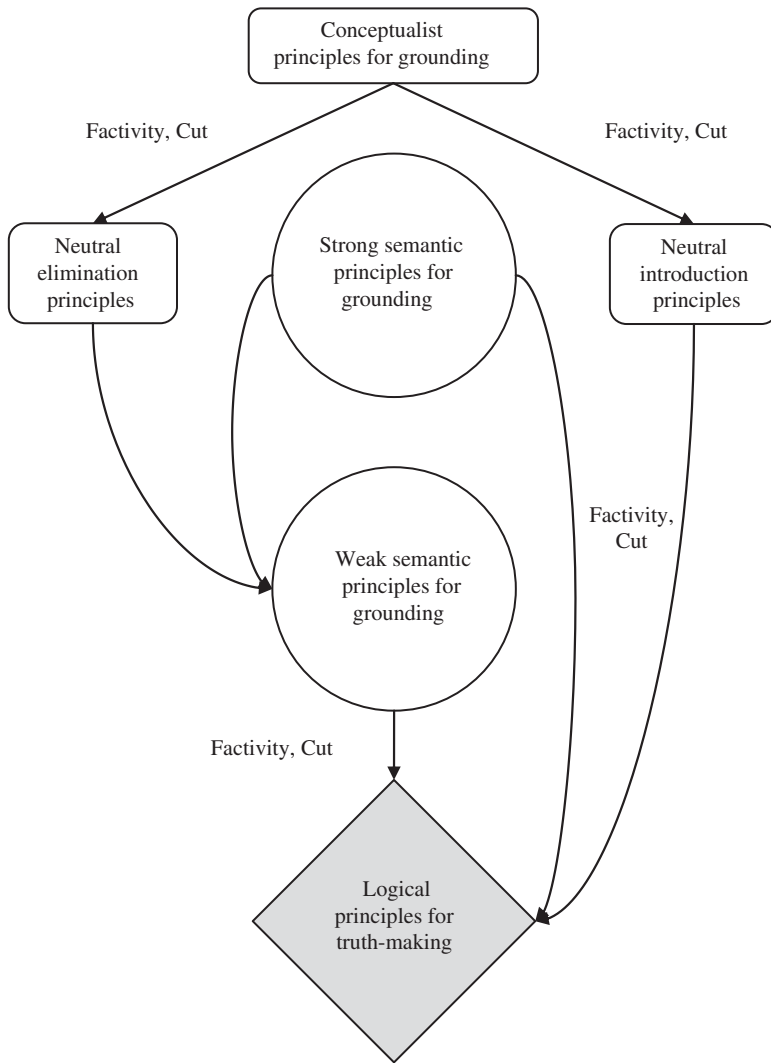


Fig. 6.3 From grounding to truth-making: Logical principles III

which many take to be true.⁸ The converse of the Tarskian principle mentioned earlier, namely:

If ϕ , then $T\phi$, Tarski[←]

⁸ I gave the principle the label of a structural principle, but of course it may be argued that it is rather a logical principle.

is also derivable from Aristotle, thanks to Factivity. Finally, using Cut one can also derive:

t8. If $E!X \triangleright \phi$, then $X \models \phi$.

Despite its plausibility, Aristotle generates inconsistency in the presence of other principles which are themselves plausible. Fine (2010) establishes that principles analogous to Aristotle, the conceptualist Existential Introduction Lg3 and certain other assumptions, in particular about sentences, propositions or facts, are together inconsistent with the view that grounding is irreflexive and transitive.⁹ Instead of presenting the Finean arguments, let me illustrate the problem starting from Aristotle itself rather than the Finean analogues.

Lg3 concerns quantification into nominal position. But consider the corresponding principle about quantification into sentential position, more precisely the following special case:

(i) If $T\phi$, then $T\phi \triangleright \exists \xi T\xi$.

The principle says, roughly, that if something is a truth, then its being true grounds the fact that there is least one truth. Now let ' σ ' be short for ' $\exists \xi T\xi$ '. Thus one instance of (i) will be:

(ii) If $T\sigma$, then $T\sigma \triangleright \sigma$.

Given that it is true that σ , we can infer:

(iii) $T\sigma \triangleright \sigma$.

But since σ , by Aristotle we have:

(iv) $\sigma \triangleright T\sigma$.

(iii) and (iv) are inconsistent with Cut and Irreflexivity.

The neutral principle corresponding to (i), namely:

(I) If $\Delta \triangleright T\phi$, then $\Delta \triangleright \exists \xi T\xi$,

also generates inconsistency. In fact, an instance of (I) is:

(II) If $\sigma \triangleright T\sigma$, then $\sigma \triangleright \sigma$.

⁹ As in Fine (2012), in the 2010 paper, Fine actually works with a weaker version of Existential Introduction, where ' $F(a)$ ' is replaced by ' $F(a)$ and a exists'. I should also say that he formulates the arguments using a notion of partial grounding instead of grounding *simpliciter*. Let me finally mention that Fine also presents arguments involving universal rather than existential quantification, which I find less convincing.

Again, given that σ , by Aristotle we can infer (iv) above, which by (II) leads to:

(III) $\sigma \triangleright \sigma$.

(III) violates Irreflexivity.

Something needs to be done. Some might react by rejecting (i) and (I) on the general grounds that quantification into sentential position is meaningless. I do not find this reaction plausible. But even if it is accepted, the Finean arguments—which involve only standard quantification into nominal position—remain. It is beyond the scope of this chapter to discuss in details the options which are available, be it in response to the arguments above or in response to the Finean arguments, and I refer the reader to the excellent discussion in Fine (2010).

6.7 What Then?

I have so far discussed a number of principles about truth-making and grounding and their connections, and I have left a number of issues about these principles open or unresolved. This study has also been largely incomplete insofar as there are a number of important questions about truth-making which I have not addressed.

For instance, I have discussed only three logical principles for truth-making, namely the following introduction principles:

- lt1. If $X \vDash \phi$ and $Y \vDash \psi$, then $X, Y \vDash \phi \wedge \psi$ *Conjunction Introduction*
- lt2. If $X \vDash \phi$ or $X \vDash \psi$, then $X \vDash \phi \vee \psi$ *Disjunction Introduction*
- lt3. If $X \vDash F(a)$, then $X \vDash \exists xF(x)$. *Existential Introduction*

But there are other principles of the same vein which have some plausibility, for instance:

- If $X \vDash \neg\phi$ or $X \vDash \neg\psi$, then $X \vDash \neg(\phi \wedge \psi)$ *Neg. Conj. Introduction*
- If $X \vDash \neg\phi$ and $Y \vDash \neg\psi$, then $X, Y \vDash \neg(\phi \vee \psi)$ *Neg. Disj. Introduction*
- If $X \vDash \phi$, then $X \vDash \neg\neg\phi$. *Double Neg. Introduction*

I have also left aside principles concerning universal quantification, and certain elimination principles, for instance the following two principles:

- If $X \vDash \phi \wedge \psi$, then $X \vDash \phi$ and $X \vDash \psi$ *Conjunction Thesis*
- If $X \vDash \phi \vee \psi$, then $X \vDash \phi$ or $X \vDash \psi$, *Disjunction Thesis*

which are discussed in the literature.

The work that remains to be done is thus very substantial. But I believe that the foregoing provides an outline of how it can be carried out.

Acknowledgments I wish to thank the participants of the PERSP Metaphysics Seminar (University of Barcelona, May 2011) for a helpful discussion on the topic of this chapter. This work was carried out while I was in charge of projects PP001-114758 and CRSI11-127488, both financed by the Swiss National Science Foundation, and a member of project PDFMP1-132420, also financed by the Swiss National Science Foundation, and project CSD2009-0056, financed by the Spanish Ministry of Science and Innovation. The research leading to these results has also received funding from the European Community's Seventh Framework Programme under grant agreement PITN-GA-2009-238128.

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