

Truthmaker Realism¹

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Abstract

We take as our starting point a thesis to the effect that, at least for true judgments of many varieties, there are parts of reality which make such judgments true. We argue that two distinct components are involved in this truthmaker relation. On the one hand is the relation of *necessitation*, which holds between an object x and a judgment p when the existence of x entails the truth of p . On the other hand is the dual notion of *projection*, which holds between a judgment p and an object x when the truth of p entails the existence of x . A truthmaker for a judgment p is then a necessitator for p which satisfies the further constraint that it is part of p 's projection. We offer a formal theory of the truthmaker relation thus defined, exploiting ontological tools of basic mereology and the theory of dependence. We then apply the theory to a range of problems connected with generic expressions, ellipsis, vagueness, and indexical and perceptual judgments.

1. Two Sides to Truthmaking

There are two aspects of truthmaking, corresponding to the two directions of fit between judgment and reality. On the one hand, reality constrains the practice of judgment by determining which contingent judgments are true. On the other hand, our practice of judgment affects reality itself, in the weak sense that when we make (true) contingent judgments, then we thereby – wittingly or not – delineate corresponding truthmaking chunks of what is real. Writings on truthmaking in recent years have concentrated primarily on the first of these aspects.² My aim in what follows will be to show that some of the problems faced by existing truthmaker theories can be solved if account is taken also of the second aspect.

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²See for example Mulligan *et al.* 1984, Fox 1986, Bigelow 1988, Armstrong 1997.

One easy route to a theory of truthmaking would employ sentential nominalizations, for example of the form *the fact that*. What makes it true that *p*, on such a theory, is simply *the fact that p*. The problem for such approaches, attractive as they are to armchair ontologists, turns on the fact that they leave unanswered what *facts* might be. More importantly still, they leave unanswered the question as to what parts of the underlying reality given facts might correspond. This latter question, the answers to which will vary greatly for different sorts of facts, must in any event be addressed, via an approach to reality which we might call that of the hunter-gatherer ontologist, and it is such an approach which will be adopted in what follows. Reality will be assumed to be at bottom physical, but to contain also such common-or-garden substances as you and me, your chair and my table, which are in some (mereological) sense built up out of lower-level physical substances such as molecules and atoms. It will be assumed to contain also such common-or-garden tropes (events, processes, moments) as headaches, smiles, knots, explosions, as well as higher-order tropes such as are involved in making true a judgment like ‘The clumsiness of Paolo’s buttering of the toast was more painful to Maria than was the jarringness of the noise he made in his sharpening of the knife.’ Since we shall be concerned chiefly in what follows with the truth of natural language judgments, it is among worldly items of these sorts that the truthmakers we are hunting for will be primarily located.

Tropes typically stand to substances in a relation of one-sided necessary existential dependence. A smile smiles only in a human face. Judgments, too, are tropes; they are mental episodes. Thus if I look up into the sky and I *see that* yonder bird is flying high, then my judgment is dependent for its existence on the pertinent judging subject (me) and also, in this case, on its objects (yonder bird, yonder bird’s flight). It is judgments in this sense which will serve as prototypical bearers of truth in the theory which follows.

Reality will be assumed to contain also the parts and aggregates of substances and tropes, including hybrid aggregates comprehending both substances and tropes together. Some parts and aggregates are, like Queensland, or Indonesia, or Papua New Guinea, gerrymandered beings: they exist only in virtue of our human demarcations. This gerrymanderedness is however strictly mereological. Thus it does not yield negative, disjunctive, or implicative objects – or other putative products of applying logical operations to objects rather than to judgments (or to other bearers of truth), where such operations properly belong. The logical constants do not represent. This is the first *fundamental idea* underlying truthmaker theory.

It is a matter for ultimate science to determine what sorts of non-gerrymandered things there are at the level of ultimate worldly furniture. But whatever these things might turn out to be, the gerrymandered things we find around us will still exist; they will need to be a part of our ontology, and some of

them – this is one upshot of what follows – will still play a role in making true our natural-language judgments.

2. Mereology

The main instrument for investigating the truthmaker side of the truthmaker-truthbearer relation is basic mereology.

x, y, \dots , in what follows, range over contingently existing objects (substances, tropes, the aggregates and parts thereof), and ϕ is a schematic letter standing in for one-place predicates holding of such objects. The primitive relation ‘ x is part of y ’ is symbolized by ‘ $x \leq y$ ’; overlap (O) and other mereological relations are defined in terms of \leq in the obvious manner.

\leq is a reflexive, transitive relation which satisfies a principle of summation asserting, for any predicate ϕ , that, if this predicate has one or more individual instances, then there is a mereological sum or fusion of these instances, which will be denoted by ‘ $\sigma x\phi x$ ’, the sum of all ϕ -ers. Importantly, for typical substituends for ‘ ϕ ’ the reference of ‘ $\sigma x\phi x$ ’ will vary (as one might put it) from world to world. In such cases we shall say that ‘ $\sigma x\phi x$ ’ refers generically. ‘ σ ’ is thus analogous to Russell’s description operator ‘ ι ’, and in case nothing ϕ ’s, the resulting σ -expression is to be treated in standardly Russellian fashion.

$$T\leq \quad \exists x\phi x \text{ if and only if } E!(\sigma x\phi x)$$

Here ‘ $E!x$ ’ abbreviates ‘ x exists’, and is synonymous with ‘ $\exists y(y = x)$ ’.

With the help of the fusion operator, other useful notions are easily defined, for instance the binary sum and difference of x and y :

$$D+ \quad x + y := \sigma z(z \leq x \vee z \leq y)$$

$$D- \quad x - y := \sigma z(z \leq x \wedge \neg z \text{ O } y)$$

We can prove:³

$$T+ \quad E!x+y$$

$$T- \quad \text{if } \neg x \leq y, \text{ then } E!x-y.$$

3. From Reality to Judgment: The Theory of Necessitation

There are parts of reality which necessitate the truth of corresponding judgments. Thus if ‘John is kissing Mary’ is true, then a certain process, a kissing event k ,

³Here and in the sequel initial universal quantifiers are to be taken as understood.

necessitates this truth. John himself is not a necessitator for the given judgment, though he is a necessitator for the judgment ‘John exists’.

Necessitation is to be conceived as a real tie spanning the divide between ontology and logic. We define:

$$\text{DN} \quad xNp := E!x \wedge (E!x \Rightarrow p),$$

where $p \Rightarrow q$ abbreviates $\neg\Box(p \wedge \neg q)$, and where p, q, \dots , are schematic letters standing in for particular judgments (including perceptual judgments, for example cases of *seeing that*) and other candidate bearers of truth.

In what follows I will lay down basic desiderata of a truthmaker theory, leaving for later the task of determining the precise logic for ‘ \Box ’ which will enable them to be satisfied. This will be in any case a variable domain logic in the vicinity of S4. It should be at least consistent with a reading of the phrase ‘ $E!x \Rightarrow p$ ’ along the lines of: ‘ x is necessarily such that p ’ or ‘ x is of its nature such that p ’, and of ‘ $E!x \Rightarrow E!y$ ’ as signifying necessary existential dependence.

Every true judgment p of the form ‘ x exists’ will satisfy xNp . To see of what other sorts of judgments this holds, consider, again, the kissing k and let p stand for the true present-tense judgment ‘John is kissing Mary’. k is a relational moment. Thus it is as a matter of necessity dependent for its existence upon its bearers John and Mary (in this precise order). In addition k is, of its nature, a kissing. There is no possible world in which k exists and is not a kissing. Whence (roughly): $E!k \Rightarrow (\text{kissing}(k) \wedge \text{does_to}(\text{John}, k, \text{Mary}))$. From this we can infer, given p and $E!k$, that kNp .

4. Principles of Necessitation

From the definition of xNp we can infer immediately:

$$\text{TN}\neg \quad \text{If } xNp, \text{ then } \neg\exists y.yN\neg p$$

$$\text{TN}\Rightarrow \quad \text{If } xNp \text{ and } p \Rightarrow q, \text{ then } xNq$$

$$\text{TN}\wedge \quad \text{If } xNp \wedge q, \text{ then } xNp \text{ and } xNq$$

$$\text{TN}\vee \quad \text{If } xNp \text{ or } xNq, \text{ then } xNp \vee q$$

Other reasonable principles include:

$$\text{TN}+ \quad \text{If } xNp, \text{ then } x+yNp$$

$$\text{TN}+' \quad \text{If } xNp \text{ and } yNq, \text{ then } x+yNp \wedge q$$

So that in particular:

TN \wedge ' If xNp and xNq , then $xNp\wedge q$.

More generally:

TN σ If $\exists x\phi x$ and $\forall x(\phi x \Rightarrow xNp)$, then $\sigma x\phi xNp$

If something ϕ 's, and if, given any x , it is not possible that $x \phi$'s and x does not necessitate p , then it follows that the sum of ϕ -ers necessitates p .

What, now, of:

(*N \vee) If $xNp\vee q$, then xNp or xNq ?

Certainly nothing like this holds in general. For every x necessitates $p\vee\neg p$, according to our definitions, and we could infer from this and (*N \vee) that, for every x and every truth, x necessitates that truth (Restall 1996, p. 333). This would of course nullify the notion of necessitation as a real tie between reality and judgment.⁴

Consider:

(*N \exists) If $yN\exists x\phi x$, then $\exists x.yN\phi x$

This states that, if y necessitates that there is some ϕ -er, then there is something, namely x , which is such that y necessitates that it is a ϕ -er. If (*N \vee) is unacceptable, then we might think that its existentially quantifier counterpart will be unacceptable for analogous reasons. But the analogy does not go through. This is because, in the absence of anything like negative objects, there is no counterpart to ' $p\vee\neg p$ ' in the field of operation of the existential quantifier. Rather, the reason to reject (*N \exists) turns on the following sort of case. Let us imagine that God, in his wisdom, ordains with necessitating force that there is someone, somewhere, for Mary to love. This, surely, is consistent with there being no specific person of whom it is true that God necessitates that it is he who shall fill this role.

The converse principle is, however, acceptable:

TN \exists If $\exists y.xN\phi y$, then $xN\exists y\phi y$,

as also is:

⁴To admit (*N \vee) and to identify truthmaking with necessitation is likewise tantamount to trivializing the notion of truthmaking, since then every object would serve as truthmaker for every truth. Mulligan *et al.* 1984 embraces such an identification, but together with a weaker version of (*N \vee), restricted, in effect, to values of p and q which are logically simple. Restall 1996 would achieve the necessary restriction by identifying truthmaking with relevant necessitation.

TN \forall If $xN\forall y\phi y$, then $\forall y.xN\phi y$.

On the other hand

(*N \forall) If $\forall y.xN\phi y$, then $xN\forall y\phi y$,

is to be rejected. God, in his mercy, may grant absolution to all his subjects in a single act which enjoys, as it were, a many-rayed intentionality. It necessitates for each subject x the truth of ‘ x is granted absolution’. But then because, as is well known, absolution works only *singillatim in quamque personam* (or: one soul at a time), the same act does not necessitate the truth of ‘all my subjects are granted absolution’. This is not to say that there are no necessitators for universally quantified truths; merely, that such necessitators are not in general such as to satisfy (*N \forall).

5. Truthmaking is not Necessitating

There are malignant necessitators. Suppose God wills that John kiss Mary now. God’s willing act thereby necessitates the truth of ‘John is kissing Mary’. (For Malebranche, all necessitation is of this sort.) But God’s act is not a truthmaker for this judgment. Intuitively, truthmaking cannot be done from afar – and here we return to the second aspect of truthmaking announced at the beginning of this paper – a truthmaker for a given judgment should fall within that portion of reality to which the judgment corresponds (roughly: it should fall within the mereological fusion of all the objects to which reference is made in the judgment). Here ‘reference’, like ‘object’, has to be taken in a wide sense, a sense in which verbs, too, in their natural, veridical settings, will refer to, or represent, the worldly events, processes or states (to the individual swimmings and blushings) with which they are correlated.

God’s act falls outside the domain of what is represented in the judgment ‘John is kissing Mary’. But it will not do, if we wish to exclude truthmaking-at-a-distance, to insist on a simple mereological constraint to the effect that a truthmaker for a given judgment must be *part of* what is represented by the judgment. For suppose God has somehow secreted some portion of his willing substance into John’s leg. God’s Necessitating Will is, then, a part of what is represented by ‘John is kissing Mary’. But it would still not serve as truthmaker for this judgment.

Consider, to take another example, the true judgment ‘John is kissing Mary graciously’. Then consider that part of reality which corresponds to the adverb *graciously*. This is (let’s suppose) a second-order graciousness trope, g , dependent for its existence upon the first-order trope which is John’s kissing. g , too, since it entails the existence of the kissing, is a necessitator for the given judgment. And thus also it is a necessitator for the judgment ‘John is kissing Mary’. But surely we do not want to say that g makes it true that John is kissing

Mary. And, *a fortiori*, if John's kissing Mary graciously is irritating, then we would not want to say that the concomitant third-order trope, a certain quite specific individual irritatingness, is a truthmaker for 'John is kissing Mary' – or for 'John is moving' or, *a fortiorissimo*, for 'John exists'.

6. From Judgment to Reality: The Theory of Projection

A truthmaker for a given judgment must, then, be more than a mere necessitating part of that portion of reality to which the judgment corresponds. It must be, of its nature, the right sort of part. It must be part of that which the judgment is *about*, must satisfy some relevance constraint. As a first step towards making these ideas precise, we introduce the notion of the projection of a judgment, a notion which is in some ways dual to that of necessitation. We define:

$$DP \quad xPp := p \wedge (p \Rightarrow E!x)$$

All true judgments p of the form 'x exists' will satisfy xPp . To see of what other sorts of judgments a relation of this sort holds, we need to draw on the thesis that it is through perception that the real tie between judgment and reality is primarily established.⁵ Suppose p is my judgment, now, to the effect that John is kissing Mary, a case of *seeing that*. Call this act of judging a (' a ' is the name of a certain mental event). a then depends necessarily upon an associated act of simple seeing b of the pertinent kissing event k . a could not exist unless the act of seeing b occurs, and b 's existence in turn entails the existence of k . Perceptual judgments in general have the peculiar feature that to be true they must be linked by some real tie to a certain portion of reality. Hence, such judgments cannot be true, unless they are themselves portions of reality. Hence, in the given case, $p \Rightarrow E!a$, and from this and $E!a \Rightarrow E!k$ we can infer, given p , that kPp .

7. Principles of Projection

How far can we bootstrap ourselves beyond the narrow class of existential and indexical/perceptual judgments to which the formula xPp most directly applies?

Again trivially:

$$TP\neg \quad \text{If } xPp, \text{ then } \neg\exists y.yP\neg p$$

On the other hand, however,

$$(*P\leq) \quad \text{If } xPp \text{ and } y \leq x, \text{ then } yPp,$$

⁵Valuable insights in this respect are provided by Mulligan, who defines

a makes p true iff (1) a exists, and (2) p , and (3) it is possible that there is a perception which is of a and fits a , and (4) this perception defeasibly and non-inductively justifies p . (1998, p. 186)

is to be rejected, not only because mereological essentialism is false, but also, and more importantly for us here, because of the malignant necessitator considerations introduced above. If ‘John is kissing Mary’ entails that John exists, then it does not entail that the molecules in John’s knee exist. A modified version of (*P \leq) can however be accepted, in virtue of what we shall come to recognize as certain special features of σ . This asserts that, if x belongs to the projection of p , then so also does $x-y$, the result of deleting some portion of x :

TP $-$ If xPp and $\neg x \leq y$, then $x-yPp$

We also have

TP $+$ If xPp and yPq , then $x+yPp \wedge q$,

and thus in particular we have:

TP $+$ ’ If xPp and yPp , then $x+yPp$.

More generally:

TP σ If $\exists x\phi x$ and $\forall x(\phi x \Rightarrow xPp)$, then $\sigma x\phi xPp$

We can infer also:

TP \Rightarrow If xPp and $q \Rightarrow p$ and q , then xPq

TP \Rightarrow reveals that projection does not capture exactly the notion of representation conceived in terms of the totality of that to which reference is made in a given judgment. Consider, for example, the judgment ‘John is dead’. And assume, as seems reasonable, that the occurrence of John’s funeral entails the prior occurrence of John’s death. Then we could infer from (John’s death)P(‘John is dead’) and ‘John’s funeral occurred’ to (John’s death)P(‘John’s funeral occurred’). This, however, conflicts with a surely sound intuition to the effect that John’s death does not fall within the representational scope of ‘John’s funeral occurred’.

(*P \vee) If xPp , then $xPp \vee q$

is not admissible. This goes hand in hand with the fact that xPp is always false when p is necessarily true (and thus specifically it is false in the case of judgments of the form $p \vee \neg p$). *Logically necessary truths* (this is another fundamental idea adopted in the best truthmaking circles) *do not represent*.

TP \vee If $xPp \vee q$, then xPp or xPq ,

on the other hand, can be accepted, unlike:

(*P \wedge) If $xPp \wedge q$, then xPp and xPq

To see what is wrong here, take x the sum of my arm and your leg, and consider the judgment-pair: ‘My arm exists’, ‘Your leg exists’.

TP \wedge If xPp and xPq , then $xPp \wedge q$

TP \exists If $xP\exists y\phi y$, then $\exists y.xP\phi y$

are acceptable; not however:

(*P \exists) If $\exists y.xP\phi y$, then $xP\exists y\phi y$.

Again, we would be wrong to seek support for the failure of (*P \exists) in an analogy with (*P \vee). Rather, the reasons for rejecting (*P \exists) turn on cases of the selectivity of projection like the following. Suppose ϕ is the predicate ‘is beloved of God’, and suppose that the south pole of this magnet both necessitates the existence of the north pole of this magnet and is beloved of God. Then there is something (y) which is such that its being beloved of God entails the existence of (x) the north pole of this magnet. A judgment to the effect that *something* is beloved of God does not of itself, however, entail the existence of the north pole of this magnet.

(*P \forall) If $xP\forall y\phi y$, then $\forall y.xP\phi y$

has to be rejected in virtue of a sustainable analogy to the discredited (*P \wedge).

TP \forall If $\forall y.xP\phi y$, then $xP\forall y\phi y$,

on the other hand, is acceptable.

8. The Intersection of Projection and Necessitation

One simple dual-aspect account of truthmaking would define truthmaking as the intersection of projection and necessitating: that x makes p true if and only if xNp and xPp . A truthmaker for p would on this account be an object whose existence is both a sufficient and a necessary condition for the truth of p . Something like this holds for perceptual judgments where x is an object necessitating p that is projected indexically (rigidly) by p . That it does not hold in general is seen as follows. That which a logically simple true judgment p represents is, roughly, the mereological fusion of the referents of the nominalizations of all parts of its canonical expression. The problem turns on the fact that this mereological fusion must comprehend as parts not only all those individual objects to which singular reference is made in p , but also individual counterparts of all those sorts of objects to which generic reference is made in p – and it is not, in general, determined which these counterparts should be. Suppose I assert, truly, but on the basis of nothing more than hearsay, that ‘John kissed Mary’. Then there is some individual instance, say k , of the generic *kissing*, perhaps one of many such instances, which is part of that to which I generically refer. But clearly my judgment does not entail that k exists. Yet k does make my judgment true; this judgment is true at all worlds in which k exists. The factor of generic reference means, however, that it is not the case that all the worlds at which my judgment is true will also be worlds in which k exists.

The solution is to recognize that projection may be both rigid, as in cases of perceptual judgments and judgments involving indexicals and proper names, and generic, as in other types of purely linguistically mediated reference. In fact, almost all judgments will have projections which involve some generic component. The solution to our problem of translating genericity on the level of language into objects on ontological *terra firma*, then, is to note that when x belongs generically to the projection of a judgment p , this must mean that for some predicate ϕ – perhaps the main verb of the sentence by which p is expressed, or perhaps some close cousin – x satisfies ϕ . Inspection reveals that p then entails the existence of the corresponding mereological fusion of ϕ -ers. If ‘Igor is swimming’ (p) is true, then this entails that there is a swimming of Igor, which in turn entails that there is a mereological sum of swimmings of Igor (by $T\leq$). This sum now belongs to what we might call the maximum or total projection of p , or in other words to: $\sigma x.xPp$, and it is on this total projection that we must focus in giving an account of truthmakers for judgments involving generic reference.

Some care is needed here however. For with very few exceptions every contingent judgment entails the existence of something, and by transitivity of entailments and by $T\leq$, it thus entails the existence of the sum of all existents. But then the very notion of the total projection of a contingent proposition seems to collapse into triviality: it is in every case the universe as a whole.

The error lies in confusing the total projection of p , or in other words $\sigma x(p \wedge p \Rightarrow E!x)$, with the object: $\sigma x(p \Rightarrow E!x)$, which is indeed identical with the universe whenever p is true. The two objects are of course closely related, and there is a sense in which each total projection $\sigma x.xPp$ is as large as the universe as a whole; but it is not identical therewith, since (to coin a phrase) there are worlds in which $\sigma xE!x$ exists but $\sigma x.xPp$ does not exist. Extensional mereology (Simons1987) turns out to be not so extensional after all, and in fact we have, in this world, as many universe-sized fusions as there are equivalence classes of co-entailing truths.

9. Truthmaking Defined

To make a true judgment is to carve out a certain portion of reality: the judgment's projection. A truthmaker for a judgment is, of its nature, a part of this portion of reality. (It is a necessitating part.) This suggests the following definition:

$$\text{D}\vdash \quad x \vdash p := xN(x \leq \sigma y.yPp)$$

x makes p true if and only if x is, by necessity, a part of the total projection of p .

' $\sigma y.yPp$ ', here, is rather spry. It trawls through reality, capturing in its wake, not only all those motley substances and tropes designated rigidly via p , but also all the mereological fusions of predicates whose satisfaction p entails. Thus, in Armstrongian terminology (1997, p. 199), it totals properties on its way.

What makes it true that *Harvey is a rabbit* is just Harvey; or: Harvey fused with the mereological sum of all the rabbits.⁶ What makes it true that *there are rabbits* is *inter alia* Harvey. Harvey necessitates that there are rabbits.⁷ For if Harvey exists, then he is of his nature a rabbit. Harvey necessitates that he is part of the mereological fusion of all the rabbits. If 'all rabbits are mammals' has a truthmaker, then what makes it true is: the sum of all the rabbits, viz.: $\sigma x.\text{rabbit}(x)$.⁸ The gold in Miss Anscombe's wedding ring makes it true that gold has atomic number 79.

D \vdash nicely blocks Restall's argument to triviality (*loc. cit.*). Take p a contingent truth, q a necessary truth, and assume $x \vdash p$; then $x \vdash p \wedge q$, but from

⁶Interestingly, the latter is not identical with the mereological fusion of all the rabbits *simpliciter*. This is because (in the jargon of possible worlds) the latter exists in all worlds in which there are rabbits, the former only in those worlds in which Harvey exists.

⁷If p is the judgment 'there are rabbits', then while $\text{Harvey} \leq \sigma y.yPp$, it is not the case that $\text{Harvey}Pp$.

⁸I here assume that being a mammal is an essential feature of all rabbits. Note that 'all rabbits are mammals' is true at some worlds in which it lacks a truthmaker, namely in those worlds where there are no rabbits.

this we cannot infer $x \vdash q$. Restall's refrigerator is not, after all, even a candidate truthmaker for Goldbach's conjecture.

$D\vdash$ also blocks most malignant necessitators.⁹ The orphaned portion of God's Necessitating Will is only *per accidens* a part of John's leg. Hence it is not of its nature such that it is part of the projection of 'John is kissing Mary'. John's funeral is not a truthmaker for (though it is a necessitator of) 'John is dead'.

10. Principles of Truthmaking (First Crop)

The valid principles for \vdash should now include:

$$T\vdash \quad \text{If } x \vdash p, \text{ then } p$$

since, from $x \vdash p$, we can infer that $\sigma y.yPp$ exists. Hence:

$$T\vdash \neg \quad \text{If } x \vdash p, \text{ then } \neg \exists y.y \vdash \neg p$$

We also have:

$$T\vdash \sigma \quad \text{If } \exists y.yPp, \text{ then } \sigma y.yPp \vdash p$$

If p has a projection, then p is made true by its total projection.

$$T\vdash N \quad \text{If } x \vdash p, \text{ then } xNp$$

And also:

$$T\vdash P \quad \text{If } xNp \text{ and } xPp, \text{ then } x \vdash p$$

The converse of $T\vdash P$ does not, however, hold. For while, if x is a truthmaker for p , then x is part of the projection of p , there are in general worlds at which p is true yet x does not exist.

Trivially, if x is a truthmaker for p , then x is part of the projection of 'x is a truthmaker for p'. The intuitive-seeming principle:

$$TE! \quad \text{If } E!x \Rightarrow \phi x, \text{ then } E!x \Rightarrow (E!x \Rightarrow \phi x)$$

now enables us to deduce also that, if x is a truthmaker for p , then x necessitates that x is a truthmaker for p . Whence, by $T\vdash P$ we have:

⁹It does not block malignant necessitators arising through reciprocal necessitation (as in the north pole/south pole example considered above).

$T \vdash$ If $x \vdash p$, then $x \vdash (x \vdash p)$

If x makes p true, then it is x which makes this true. Truthmaking is its own reward.

$T \vdash$ comes at a price, however, since it implies that, if the truthmaker relation holds in one instance, then it holds in an infinite number of instances. The realm of *truthbearers* is thus infinitely large. To counter this implication (in keeping with our general policy of conceiving episodic judging acts as the prototypical bearers of truth), ways would have to be found to conditionalize $T \vdash$ along the lines of: if there is a true judgment to the effect that $x \vdash p$, then x also makes this judgment ($x \vdash p$) true. (TN^+ and $TP \wedge$ would require similar adjustments.)

Trivially:

$T \vdash +$ If $x \vdash p$ and $y \vdash q$, then $x+y \vdash p \wedge q$

$T \vdash \sigma N$ If $\exists x \phi x$ and $\forall x(\phi x \Rightarrow x \vdash p)$, then $\sigma x \phi x \vdash p$ ¹⁰

11. Against Truthmaker Maximalism

Can we embrace truthmaker maximalism, a thesis to the effect that to every truth there is a truthmaker? Clearly not, if we are to avoid that sort of armchair resolution of the truthmaker problem which consists in adding ‘facts’ into our ontology.

Consider negative judgments like ‘This liquid is odourless’: there need be nothing in the liquid which excludes its being odourous: it may simply *lack* an odour. In regard to this and similar examples we can appeal to the things or substances themselves, rather than to the moments or tropes in the things, as that which does the job of making true. The liquid itself makes it true that it is not odourous. In virtue of the fact that things and substances (in contrast to events and processes) change, however, we might then need to introduce an explicit temporal dimension into our account of truthmaking, along the lines of: this liquid makes it true *at t* that it is odourless.

¹⁰We can go further along these lines if restrictions on truthbearers are allowed which are analogous to those countenanced by Mulligan *et al.* Thus for example we can unproblematically extend our definition of truthmaker as follows (using a schema which may serve in obvious fashion as basis for further recursions):

$D \vdash^*$ $x \vdash^* p :=$

for p logically simple: $x \vdash p$

for p of the form $q \vee r$, where q and r are logically simple: $x \vdash q$ or $x \vdash r$

Alternatively we might embrace a strictly presentist reading of ‘ x makes it true that p ’. Some true contingent past and future tense judgments will then be such that, while their truthmakers do not exist, they did or will exist.

All such fixes are however inadequate to deal with other classes of negative judgments patterned on cases like: ‘Ba’al does not exist’. Here there is quite literally no thing which can do the job of making true.¹¹

Some have been tempted to appeal to the world as truthmaker in cases such as this. Indeed, some have been tempted to appeal to the world as truthmaker for *all* true judgments (compare the role played by the ‘great fact’ in Davidson’s account). The world as a whole, since it contains all other candidate truth-makers as parts, would serve to make all (true, empirical) sentences true.¹² But what of those Ba’al-type cases where there is no truthmaker as part?

The thesis that the universe as a whole might serve as truthmaker for all true judgments threatens further our principle to the effect that truthmaking should be constrained by a factor of relevance. The projection constraint will in fact rule out as truthmakers even small irrelevant fusions which include relevant truthmakers as parts. Thus it will rule out, for example, that ‘John is kissing Mary’ might be made true by the fusion of John’s kissing with the mud on Napoleon’s boots.¹³

12. Ellipsis

Mulligan *et al.* defend a theory of truthmaking, at least for many types of true contingent judgment, according to which truthmakers are to be sought among the referents of nominalizations of the main verbs of corresponding sentences. That we must often look further, even in relation to judgments for which the event-nominalization approach seems right in spirit, is shown by an example such as:

(A) ‘The music caused Peter’s departure.’

Here the only candidate necessitators within the realm of nominalizations of the parts of the corresponding sentence are: the music’s causing Peter to depart, and: Peter’s being caused to depart by the music. Causing and being caused are however (or so it will here be assumed) not additional relational tropes

¹¹On our view, in fact, each pair of judgments p , $\neg p$ is such that at most only one member of the pair is in want of a truthmaker, and this want may go unsatisfied.

¹²‘[W]e want to say, surely, that if a moment a makes the sentence p true, and b is any moment containing a as part, then b makes p true as well. That John’s head ached between 1 p.m. and 1:10 p.m. is made true not just by that ten-minute segment of his headache, but by any part of it containing this segment.’ (Mulligan *et al.* 1984, p. 297)

¹³On the theory of relevant fusions see Smith 1991.

contributing to the matter of reality. Causing is not like kissing or promising. Rather, causal relations are formal ('thin', Bradleyan-regress-blocking) relations, comparable to the formal relations linking parts to wholes and tropes to their substantial bearers. 'The music's causing Peter to depart' as little picks out a portion of reality as does 'Cicero's relation of identity to Tully'. (A) is, I would argue, elliptical. A non-elliptical rendering might read as follows:

(A') 'The music caused a change in Peter's state of mind which caused his departure.'

A good candidate necessitating trope for (A'), and thus for (A), is then: the change in Peter's state of mind, a portion of reality which falls within the projection of both (A) and (A') as defined above. (We are assuming for the sake of argument that the music could not have caused Peter's departure unless it had affected him mentally in some way.) The change in question is, be it noted, a quite specific sort of mental affectedness, one which could exist only in consort with that specific music and only as giving rise to that specific departure. The change in Peter's mental state is a higher-order trope that is relational in nature, being itself ontologically dependent on these two lower-level tropes.

This analysis tells us that there is no superficial feature (for example the logical form of the corresponding sentence) which will allow us to determine in some quasi-automatic fashion the totality of all of that to which reference is made in a given judgment. Hunter-gatherer ontology in the service of truthmaker must go hand in hand with hunter-gatherer semantics.

13. Trawling Through Reality

These considerations provide us with a means of resolving a problem discussed by Bennett (1988, p. 25) in relation to judgments expressed by the following sentences:

(B) 'The music caused Peter's departure, which was noisy.'

(C) 'The music caused Peter to depart noisily.'

As Bennett points out (C) may be true, though (A) and (B) are false. (C), therefore, must have truthmakers which are not truthmakers for (A) or (B). Yet the departure and the noisy departure are in this case one and the same trope. The solution lies, again, by way of ellipsis, in an appeal to the selective power of intentionality (discussed in § 4 of Mulligan *et al.*). The necessitator for (B) is a mental affectedness on Peter's part which determines him to *depart*, and, as it happens, he departs *noisily*. The necessitator for (C), in contrast, is a different, though concomitant, mental affectedness on Peter's part, one which presupposes that he is in any case determined to depart. It adds to this the further determination that Peter will depart *noisily*.

Ellipsis is involved, too, in a case like:

(E) 'John shot Dan'

(F) 'John killed Dan'

The shooting and the killing are, we can suppose, one and the same event, an event which makes both (E) and (F) true. But there is a truthmaker for (F) which comprehends an additional event, Dan's death, as part. This more comprehensive object is not a truthmaker for (E). Truthmakers, we can see, characteristically come in families: given any true contingent judgment p , there are typically many (and typically overlapping) portions of reality x satisfying $xN(x \leq \sigma y.yPp)$.

14. Solving the Mind-Body Problem

Consider the following judgment-pair, which we are to understand as referring to one and the same event of tea-drinking in Paris one summer's afternoon:

(G) 'Estelle is taking tea with Chantal'

(H) 'Trotsky's great granddaughter is taking tea with Merleau-Ponty's niece'

Trotsky and Merleau-Ponty are not necessitators for (H). But they are involved in making (H) true in a way in which they are not involved in making (G) true. (H) demarcates, or captures within its representational scope, a larger portion of reality than does (G). (G) and (H) have necessitators in common, but their respective penumbrae of projected objects are rather different. The projection of (H), in particular, extends back in time to comprehend objects which do not exist in the present.

Consider now:

(K) 'Nicola thought about Prunella'

(L) 'Nicola underwent a C*-neuron firing'

This pair of examples reminds us that, even if the mental and physical events, the ultimate necessitating tropes for (K) and (L), are identical, the families of truthmakers for these two judgments are yet different, in virtue of their different representational scopes. The two judgments trawl through reality in different ways.

15. On Minimal Truthmakers and Vagueness

Some friends of truthmakers have embraced various forms of the idea that there is some designated truthmaker – some one single member of the family of

truthmakers for a given true judgment which is marked out as especially deserving of the label ‘truthmaker’ for the judgment in question. On one view this is a ‘minimal truthmaker’ for the given judgment.¹⁴ On another view it is a truthmaker which, in keeping with the age-old inspiration at the root of the correspondence theory of truth, comprehends all and only that which is relevant to its truth. Both these ideas are, at least for most types of natural-language judgments, to be rejected.

Suppose I judge truly, on the basis of a fitting perception, that John is kissing Mary. The family of truthmakers for my judgment then includes: the kissing *k*, the fusion of John with this kissing, the fusion of Mary with this kissing, the fusion of John and Mary with this kissing, and parts thereof which include the kissing as part. The apparent simplicity of the nominals on this list should not mislead us. It disguises a multitude of complications, complications which are familiar from the literature on the phenomenon of vagueness.

Let us begin with *k*. *k* is a certain relational event (trope, moment), which takes place at a certain time and place and which involves John and Mary as its relata. When, exactly, does *k* take place? Does it begin with the first movement of John’s head in Mary’s direction? With the first instant of contact? And what, exactly, are the motions in John and Mary which are included as parts of this event? Only the movements of John’s lips and the equal and opposite movements of Mary’s cheek? Or also the events which take place inside John’s brain and nervous system, the movements of John’s hands and legs, the steaming-up of his spectacles?¹⁵

Clearly any assumptions we might have had as to the simplicity of *k* need to be re-examined. ‘*k*’ is, in fact, a vaguely referring term.¹⁶ This is not because there are vague entities in reality, but rather because there is a whole congeries of overlapping chunks of worldly (trope) furniture which can serve as referents of this term. Some are more, some less inclusive; some more, some less deserving of the appellation ‘John’s kissing of Mary’; but all of them are capable of serving as truthmakers for the judgment at issue.

Can we now say that there is a minimal such chunk, the mereological

¹⁴Langtry 1975, Smith 1982, Mulligan *et al.* 1984, Fox 1987.

¹⁵Hunter-gatherer ontologists have a special license to ponder questions such as this.

¹⁶Compare the two theses at the root of Bennett’s theory of event nominals:

- (i) *The trope thesis*. Any event name refers to an instance of a property that includes but may not be identical with the property expressed by the predicate in the event name
- (ii) *The indeterminacy thesis*. Although there are limits as to what the named property could be, the question of what it is has no determinate answer; in this respect, our language of events contains a lot of slack. (1988, p. 128)

intersection of all the candidate referents of 'k'. The problem is that higher-order vagueness implies that the intersection here is not well defined. Since there is accordingly no lower limit to the temporal extent of the candidate referents involved, this intersection, to be non-empty, would have to be instantaneous. More precisely, it would have to be an instantaneous temporal slice of the total kissing that is exactly simultaneous with my judging act. But my judging act is not itself instantaneous (which raises yet further questions: When does *it* begin and end? And exactly which parts and moments of my brain are involved in making it true that I am now judging?).

Perhaps, then, we could allow a plurality of minimal truthmakers, namely (in this case) each and every instantaneous temporal slice of the relevant process which falls temporally within the interval when my judgment occurs. But this would still not serve, since no instantaneous temporal slice through a process that is of its nature temporally extended can serve as truthmaker for a judgment asserting that *that process is occurring*. This is because truthmakers for such present-tense judgments of continuous aspect must in every case involve processes extended across a temporal neighbourhood which includes the act of judging itself, and such a thing as a 'minimal neighbourhood' in a continuum is excluded by definition as a topological absurdity.

For judgments of the given sort, at least, no minimal truthmaker can be distinguished. The thesis that there is a single minimal truthmaker for such a judgment is comparable to the thesis that there is a single maximum number of hairs which John must not exceed if he is to hold on to the predicate 'bald'. Or better: it is comparable to the thesis that there is only first-order vagueness.

Can we, then, find distinguished truthmakers by traveling further up the hierarchy and examining the truthmakers for 'John is kissing Mary' (*p*) which lie on the mereological continuum between small referents of 'k' at one extreme and the relevant total projection, $\sigma x.xPp$, at the other? This partially ordered hierarchy of truthmakers contains hybrid wholes made up of greater and lesser portions of kissing and of the principals involved. Can we isolate some one distinguished truthmaker, which would somehow embrace all and only those portions of reality which are involved in making true the given judgment? Surely not. For while John himself would get summed into such a truthmaker, his kidneys and shins would not. But what, then, would remain of John? The thin guise? John minus everything but his quivering lips?¹⁷

These sorts of problems are only multiplied when we consider projections involving generically designated components, and thus it seems that, for many classes of judgments at least, the idea that there are specially earmarked

¹⁷The problem here is analogous to a problem addressed already by Frege and Russell as to the constituents of 'thoughts' or 'propositions'. See Smith 1989, p. 423.

truthmakers, truthmakers uniquely well fitted to do the job of making true, will have to be rejected.

16. Truthmakers are Fiat Objects

There is an analogue to the truthmaker question which relates to visual perception. Imagine that I am outdoors on a clear day looking out over the landscape. To what portion of reality is my seeing act related? Here once again we meet the problem of indeterminacy. How far upwards and outwards into the sky does my visual field extend? This question has no determinate answer; we must speak, rather, of a family of overlapping regions, no one of which has any special claim to count as *the* visual field of my current act of perception. These are not pure spatial regions; rather, they are artefacts of cognition, marked, for example, by such features as the *horizon*, a transient and incomplete and roughly linear boundary between earth and sky, whose nature, location and extent are determined by my very existence as a visually perceiving subject in a given location at a given time, as also by the perimetric properties of my visual system, by topographical features of the location, and by the laws of optics. The term 'horizon' picks out a part (a feature) of reality: it is *out there*. But it is a cognition-dependent part. It is an artefact of my visual act.

I want to suggest, now, that the family of truthmakers for a given true contingent judgment is analogous ontologically to the family of visual fields for a given act of visual perception. Truthmakers, like visual fields, are cognition-dependent entities which exist only as a result of certain sorts of cognitively effected demarcations of reality. And like visual fields, truthmakers need not be demarcated from the rest of reality by determinate outer boundaries of a physical sort.¹⁸

And now similarly: Every kiss or handshake is such as to involve real surface phenomena (relating to pressure, elasticity, etc.) as well as associated real psychological and physiological phenomena (of tactual and emotional feeling, etc.). These real phenomena provide a basis for cognitive demarcation. In comprehending the apparent contact between two bodies as a *kiss* or *shaking of hands*, our healthy common sense carves out from the pertinent dense mass of physical and psychological processes certain conventional and neatly demarcated units.

Our judgments cast their light, successively, on correspondingly demarcated truthmaking portions of this reality. Reality itself is affected by this cognitive illumination only in the sense that it becomes parceled out ephemerally into truthmakers for the judgments we throw at it. If *x* makes my judgment true,

¹⁸In this respect truthmakers are analogous also to causal systems and to certain sorts of patterns (Johansson 1998).

so that x is of its nature part of the projection of this judgment, then this is (at least in many cases) because x is itself an artefact of my judgment. Such artefactual truthmakers are not extra denizens of *bona fide* reality. Rather, they are what I have elsewhere called fiat objects,¹⁹ analogous to census tracts and postal districts, objects which come to be delineated in reality only in virtue of corresponding cognitive practices on the part of human beings. Truthmakers are to this degree human constructions. They are gerrymandered. But they are also, like New South Wales, chunks of reality.

Compare the way in which boundary lines are drawn on a map. The State of Indiana is, we can say, delineation-dependent on certain geographical decisions made by Jefferson in 1784. Yet clearly Jefferson did not bring the underlying mass of territory into existence from out of nowhere. When I judge that John is kissing Mary, I effect a certain fiat delineation of that whole which consists of John and Mary joined together through a certain complex of physiological and psychological events. The latter are, if you like, set into relief against a background that includes a larger mass of physiological and psychological events and processes with which they are reticulated in reality. But this mass of reality is not in any way, really, changed thereby. And similarly when I judge that viruses of the *Filoviridae* family cause disseminated intravascular coagulation marked by blood clots and hemorrhaging concentrated in the liver, spleen and brain, then I effect a certain fiat delineation of biological and epidemiological reality – a reality which is again, leaving aside my fiat delineation, not in any way affected thereby. A view of truthmakers as human constructions along the lines presented here is thus perfectly compatible with a view of truth as something entirely objective. As Frege writes: the objectivity of the North Sea ‘is not affected by the fact that it is a matter of our arbitrary choice which part of all the water on the earth’s surface we mark off and elect to call the “North Sea”.’ (*Grundlagen*, §26)

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¹⁹Smith 1995, Smith and Varzi (forthcoming).

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