

## Troubles with Truth-making: Necessitation and Projection

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### Abstract:

The main question of this paper is how to understand the notion of a truth-maker. In section 1, I show that the identification of truth-making with necessitation cannot capture the pretheoretic understanding of notions such as ‘*x* makes something true’. In section 2, I examine Barry Smith’s reaction to this problem: he defines truth-making as the combination of necessitation and projection. I focus on the formal part of Smith’s account, which is shown to yield undesired results. However, in section 3 I present an alternative account of projection, which fares better and can fruitfully be employed to circumvent the problems raised in section 1. Unfortunately, the account still has to face some troublemakers, as I show in the final section. I conclude, therefore, with a pessimistic view on the project of defining truth-making via necessitation and projection.

## 1. Truth-making and Necessitation

Let us say an entity  $x$  necessitates the statement that  $p$  iff necessarily, if  $x$  exists, then  $p$ .<sup>1</sup> Most philosophers working on the idea of truth-making would agree that the concept of truth-making is intimately related to the concept of necessitation. Indeed, sometimes these two notions are simply identified.<sup>2</sup> Such an identification is harmless if the phrase “is a truth-maker of” is taken to be a merely stylistic variant of “necessitates” (which is defined as above).

But although the expression “truth-maker” is of a recent coinage and a genuine term of the art, most philosophers working with it do *not* introduce it via an explicit definition which lends it a precise meaning. Rather they rely on certain pre-theoretic intuitions about how to use the term and would treat the equation of necessitation and truth-making as a *hypothesis* to be *tested* against those intuitions. The intuitions in question stem, at least partly, from intuitions about the correct use of two other, somewhat less technical idioms (or groups of idioms). One of them is an obviously close relative of “is a truth-maker” – it is the idiom “(something) makes (something) true”. Though the use of this expression is certainly *limited* in everyday language, it belongs, together with some idiomatic variants such as “(something) makes (something) *come* true”, to the linguistic stock of most English speakers (wishes, hopes, fears can be made true, and sometimes you have the opportunity to make somebody else’s dreams *come true*). The second is an idiom of which philosophers have made much use recently, the idiom “(something) is true in virtue of (something)”. So we can formulate the following two intuitions, which are partly constitutive of the meaning of “truth-maker” in the mouth of many philosophers:

(Intuition-1) A truth-maker of  $s$  is something which makes  $s$  true.

(Intuition-2) A truth-maker of  $s$  is something in virtue of which  $s$  is true.

Judged from such intuitions, the equation of necessitation and truth-making is a failure, which is a lesson to be drawn from the *problem of unwelcome truth-makers*. The problem is, in a nutshell, that the truth of many true statements is ensured by the existence of certain entities, while it nevertheless seems to contradict the spirit

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<sup>1</sup> Though I prefer to take propositions to be the primary truth-bearers, I do not want to decide matters here. Thus I deliberately use the ambiguous ‘statement’, as to indicate tolerance with regard to the question of what kind of entity is made true.

<sup>2</sup> Cp. Fox (1987: 189).

of the idea of truth-making to countenance those entities as truth-makers of the statement.

The *problem of unwelcome truth-makers* is widely acknowledged with respect to *necessary* truths.<sup>3</sup> If truth-making were none but necessitation, then every old object would qualify as a truth-maker of any necessary truth. Jean would thus be a truth-maker of the arithmetic truth that 5+6 equals 11. But this seems to be incompatible with the intuitions mobilised by proponents of truth-maker theories.

It is less often recognised, however, that the problem of *unwelcome truth-makers* also arises with regard to certain contingent truths. Take, for example the statement:

(1) Jean is singing.

A proper truth-maker of (1) would be Jean's singing.<sup>4</sup> But there are apparently other entities that *necessitate* (1): for example my knowledge that Jean is singing, the beauty of her singing, and my perception of her singing.<sup>5</sup> So, if truth-making is nothing but necessitation, those entities are truth-makers as well.<sup>6</sup> However, although they may well necessitate statement (1), it does not seem appropriate to hold either

(1\*) The beauty of Jean's singing makes it true that Jean is singing.

or

(1\*\*) That Jean is singing is true in virtue of the beauty of her singing,

or any of the variants that we get by replacing "the beauty of her singing" in (1\*) or (1\*\*) by "my perception of her singing" or "my knowledge that Jean is singing" respectively.

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<sup>3</sup> See for instance Restall (1996: 334), Rodriguez-Pereyra (2000: 262), and Williamson (1999: 254).

<sup>4</sup> Henceforth, I shall concentrate on that variety of truth-maker theories which takes *tropes* (particularised properties and events) as truth-makers (rather than, say, facts).

<sup>5</sup> Whether these entities in fact necessitate (1), hinges upon certain more or less controversial theses, such as: (i) Perception is an informational state individuated via its causal origin (cp. Evans 1982: 122-129). (ii) Knowledge is a factive state (Williamson 2000: ch. 2) and no particular piece of knowledge could have been a mere belief (notice that Williamson hesitates to apply his thesis to *token* states because of some general worries about the idea of such entities; op. cit. 40). (iii) Tropes are dependent upon their bearers (cp. Mulligan *et. al.* 1984 : 294).

<sup>6</sup> Smith (1999: 278) offers two similar examples of unwelcome truth-makers; one involves God's verdicts, the other second-order tropes.

So there can be entities which are necessitators of some statement but disqualify as truth-makers of it in light of the intuitions expressed in (Intuition-1) and (Intuition-2). That is a reason not to identify truth-making with necessitation. (That the cited cases really necessitate (1) hinges, as noted before, on some other theses; I will not defend any particular of the relevant theses here – it is not necessary to do so. Whoever does not dismiss these claims out of hand, has some reason to be bothered by the threat of the *problem of unwelcome truth-makers*.)

A philosopher who acknowledges the problem above but who does not give up the prospect of providing some proper explication of the concept of truth-making could react in two ways: either (i) she denies the equation of truth-making and necessitation but holds that necessitation nevertheless plays *some* role in explicating the notion of a truth-maker, such that truth-making will equal necessitation “*plus X*”, or (ii) she gives up the idea that necessitation has any role to play in the explication of truth-making and seeks for a different approach.<sup>7</sup> The remainder of this essay is a discussion of a specific development of the first of these strategies which I will introduce and discuss in the coming section.

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<sup>7</sup> An idea which has attracted some philosophers is to shift to a notion of relevant implication (the idea was endorsed by Restall in his 1996 paper). Another idea (which I develop in Schnieder: forthcoming) is to define the concept of a truth-maker with recourse to an *explanatory* notion.

## 2. Projection

In his 1999 article, Barry Smith proposed a novel analysis of truth-making that is supposed to incorporate the cure against the problem of unwelcome truth-makers. He thinks to improve upon the matters by combining the condition of necessitation with the condition of *projection*. By the projection of a statement Smith means something similar to what is often called the *ontological* or *existential commitments* of a statement: roughly, a statement projects on those entities which must exist for the statement to be true.

Smith's strategy may seem promising. The problem of unwelcome truth-makers is that some entities, though their existence is *sufficient* for the truth of a given statement, are not the right things to *make it true*, because they are in a way 'too remote' from what the statement is about. This kind of remoteness, so the idea, is reflected by the fact that the statement is not committed to these entities.

Recently, in his 2001 article, Dominic Gregory produced some thorough criticism of Smith's account, trying to show that it falls short of serving Smith's purposes. But Smith is not convinced. Although he admits that Gregory pointed his finger to some weaknesses in Smith's presentation of his own account, he holds that the statements which Gregory attacks 'belong to the informal commentary and not the formal machinery of "Truthmaker Realism"' (Smith 2002: 233). But, Smith argues, on inspection this machinery proves to work in a different way than the informal remarks may suggest.

Since he does not himself make many efforts on showing how his machinery *is* supposed to work, his reaction to Gregory is an invitation to take a closer look at the formal apparatus which Smith provided in his article (an apparatus which is not particularly perspicuous). I'd like to follow this invitation; it will be seen that the formal apparatus is unfortunately not better off than Smith's informal remarks. However, in the next section of this paper I will present an alternative account of projection (and, based upon that, of truth-making) which exploits Smith's basic idea in a more appropriate way.

So let us now focus on Smith's definition of truth-making (Smith 1999: 282; 2002: 231); it involves a somewhat complicated symbolism:

(Df. TM)  $x$  makes it true that  $p \leftrightarrow_{\text{df.}} x \text{ N } (x \leq \sigma y.y \text{ P } p)$ .

The symbols can be read as follows:

'N' stands for 'necessitates',

'P' stands for 'projects upon',

' $\leq$ ' stands for 'is a proper or improper part of', and

' $\sigma y \dots y \dots$ ' stands for 'the mereological fusion of all  $y$ , such that  $\dots y \dots$ '.

Informally put, the definiens of (Df. TM) then reads:  $x$  necessitates that  $x$  is (a proper or improper) part of the total projection of the statement that  $p$ , where the *total projection* of a statement is the mereological fusion of all entities upon which *it* projects.

Before examining (Df. TM) step by step, we should ask ourselves why Smith chose this complicated approach. One might think that, instead of talking about the total projection of a statement, he could simply have relied on the notion of projection and defined a truth-maker as something which both necessitates a statement and is projected upon by it, where projection is defined as follows:

(Df. RP) the statement that  $p$  projects on  $x \leftrightarrow_{\text{df.}} \Box (p \rightarrow E!x)$ .

But Smith (1999: 281) correctly points out that this would be a failure. The reason is that (Df. RP) yields a notion of *rigid* projection, while many truth-makers of statements are certainly not rigidly projected upon. Regard again (1); its truth-maker should be Jean's singing. Is it projected upon by (1)? In fact, not many entities enjoy this attention from ordinary statements such as (1). Among the few that are thus projected upon is obviously Jean herself, and are all necessary existents. Furthermore, entities upon which Jean ontologically depends (which might perhaps be her parents, if genetic essentialism is right) also are projected upon by (1) (and, analogously, entities upon which some necessary existent depends fulfil it too). But apparently nothing else is. In particular, Jean's singing is *not*: the event which is in fact Jean's singing is not such that necessarily, if Jean is singing,

then *it* occurs. After all, Jean could have sung another singing (to make use of an uncommon but comprehensible internal accusative).<sup>8</sup>

Thus, Jean's singing would not qualify as a truth-maker of (1) if a requirement would be that (1) rigidly projects upon it. Because of that, Smith developed his more complicated approach. By employing his expression ' $\sigma y (p \ \& \ \Box (p \rightarrow E!y))$ ', he thinks to rely on a notion of *generic* projection (Smith 1999: 281f.). The expression, he writes, captures 'not only all those motley substances and tropes designated rigidly via *p*, but also all the mereological fusions of predicates whose satisfaction *p* entails' (Smith 1999, 282).<sup>9</sup>

Smith's talk about the fusions of *predicates* seems to be a slip of the pen – obviously he intended to speak about the fusions of *the objects satisfying* the predicates whose satisfaction is entailed by *p*. His basic idea is that if the statement that *p* implies there being  $\phi$ s, then *the fusion of all*  $\phi$ s will be part of the denotation of ' $\sigma y (p \ \& \ \Box (p \rightarrow E!y))$ ', although it might be that the existence of none of the individual  $\phi$ s is required for the truth of the statement.

To see whether this really is a result of Smith's formula, we should return to his proposal (Df. TM). By applying the definition of 'N' (the symbol for 'necessitates'; cf. Smith 1999: 276) we unfold the definiens to the following formula:

(Dfs-TM)  $E!x \ \& \ \Box (E!x \rightarrow (x \leq \sigma y.yPp))$ .

Unpacking of 'P' (cf. Smith 1999: 279) yields:

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<sup>8</sup> This claim makes some (plausible) presuppositions about the individuation of events which are shared by ordinary conceptions of events. Presumably, though, Kim's account of events (see e.g. Kim 1976), under which they are conceived of as rather fact-like entities, would not support my claim. But with Kim's conception we would still have an analogous case if we shifted the example to the statement: 'Jean *was* singing.' Even if events are individuated in Kim's manner, there is no unique singing which would have to take place for *this* statement to be true.

However, as a referee pointed out to me, *facts* might be individuated in a way such that the argument above would not go through: they might, for instance, be individuated as to secure a one-to-one correspondence from truths to facts. A truth-maker theory relying on facts instead of tropes (which would be a theory quite remote from the one Smith endorses and I am concerned with here) might therefore be immune against my line of argument.

<sup>9</sup> Smith partially withdrew from this claim later (2002: 233) while he did not specify how it should be modified. Anyway, this should not bother us here, since we are discussing Smith's *formal* account, and not his informal comments upon it (whether modified or not).

(Dfs-TM\*)  $E!x \ \& \ \Box (E!x \rightarrow (x \leq \sigma y (p \ \& \ \Box (p \rightarrow E!y) )))$ .

As a proper truth-maker for (1), Jean's singing should satisfy the relevant instance of (Dfs-TM\*), which we get by substituting 'Jean is singing' for ' $p$ ':

(TM-1)  $E!x \ \& \ \Box (E!x \rightarrow (x \leq \sigma y (\text{Jean is singing} \ \& \ \Box (\text{Jean is singing} \rightarrow E!y) )))$ .

Because we assume (1) to be true, Jean's singing takes place and thus it satisfies the first conjunct of (TM-1). To satisfy also the second conjunct, Jean's singing has to necessitate itself being part of the fusion denoted by the involved sigma-expression

( $\sigma$ -1)  $\sigma y (\text{Jean is singing} \ \& \ \Box (\text{Jean is singing} \rightarrow E!y) )$ .

As remarked before, ' $\sigma y.\phi y$ ' abbreviates the phrase 'the mereological fusion of all  $y$  such that  $\phi y$ '. So, ( $\sigma$ -1) can be read, a little less formally: the mereological fusion of all  $y$  such that Jean is singing and, necessarily, if Jean is singing, then  $y$  exists.

What things are part of the mereological fusion denoted by an instance of ' $\sigma y (... y ...)$ '? In the first place, an entity can belong to it for the following reason:

- (i) It satisfies the propositional function following the ' $\sigma y$ '.

Thus, everything which satisfies "is a human being" – i.e. every human being – is part of the denotation of ' $\sigma y (y \text{ is a human being})$ '.

Since parthood, however, is transitive, something can be a part of the fusion also for another reason:

- (ii) It is a proper part of some entity which satisfies this propositional function.

Thus, every part of a human being is part of the denotation of ' $\sigma y (y \text{ is a human being})$ '.

Finally there is a third way of belonging to the fusion denoted by ' $\sigma y (... y ...)$ ', at least according to some conceptions of fusions, namely by

- (iii) being a fusion of entities satisfying either (i) or (ii) above.

Such a fusion need not in general fulfil either of the two conditions. Under this conception, the fusion of Adam and Eve is a part of the fusion of all humans; however, it is neither human itself, nor is it a part of a human; it is *fused* of humans.

Applying this insight to ( $\sigma$ -1), we find that parts of the fusion denoted by it (let me call this fusion  $\Sigma$ -1 for short) should either



- (i) satisfy the propositional function ‘ $\Box (\text{Jean is singing} \rightarrow E!y)$ ’,<sup>10</sup> or
- (ii) be part of something which satisfies it, or
- (iii) be a fusion of entities satisfying (i) or (ii) above.

I will now show that Jean’s singing meets none of these conditions, and henceforth is not even *actually* a part of  $\Sigma\text{-1}$  – a fortiori it does not *necessitate* its being part of it and therefore disqualifies as a truth-maker of (1) by the standards of (Df. TM).

We have already dismissed option (i). Jean’s singing, this very occurrence, could have stayed out of existence while Jean had still been singing (as remarked above, Smith is wholly aware of this fact). What about condition (ii) then? None of the entities that may plausibly satisfy (i) seem to have any singing as a proper part – neither Jean, nor necessary existents, nor Jean’s parents etc. have *singings* as proper parts. Finally, condition (iii) can be dismissed also: Jean’s singing does not seem to be a mereological fusion at all, let alone one composed of entities satisfying (i) (i.e. Jean, necessary existents, Jean’s parents etc.) or parts of those. So, it seems that Jean’s singing does not qualify as a part of  $\Sigma\text{-1}$  on any of the conditions cited above. But wait! We should remember Smith’s claim to the effect that he takes *the fusion of all singings* to be part of  $\Sigma\text{-1}$ . If he is right, then condition (ii) will make Jean’s singing part of  $\Sigma\text{-1}$ , because the singing is part of the said fusion of singings.

But is he right? If the fusion of all singings is part of  $\Sigma\text{-1}$ , then at least not for the reason that it satisfies condition (i) above, i.e. for the reason that it satisfies the propositional function ‘ $\Box (\text{Jean is singing} \rightarrow E!y)$ ’. Of course, if Jean is singing, there must be *some* fusion of all singings, but the *actual* fusion of all singings need not exist for the proposition that Jean is singing to be true. So *it* is not such that, necessarily, if Jean is singing, then *it* exists. But the fusion of all singings fares no better with respect to the other two conditions. It is not part of one of the things satisfying (i) – as we have seen, no thing “big enough” for this satisfies (i). And it is not composed of entities satisfying either (i) or (ii) – it is composed of singings, and not even Jean’s singing satisfies (i) or (ii), while other singings are still worse candidates to do this job. So Smith is wrong in maintaining that the fusion of all singings is a part of  $\Sigma\text{-1}$ .

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<sup>10</sup> I dropped the first of the conjuncts of the propositional function in ( $\sigma\text{-1}$ ); it is true by hypothesis.

But then he is also wrong in maintaining that Jean's singing is part of  $\Sigma-1$ , the fusion denoted by  $(\sigma-1)$ . So, Jean's singing is not part of the total projection of (1), and cannot *necessitate* its being part of the total projection of (1) either; hence, it is ruled out as a truth-maker by the standards of Smith's definition of 'truth-maker'. The same is true for any plausible candidate of being a truth-maker of (1); according to this proposal, there simply are no truth-makers for (1). But then we must acknowledge that Smith's formal apparatus does not help us with the problem of unwelcome truth-makers; it gets only rid of them by getting rid of *any* truth-maker whatsoever – (Df. TM) throws out the baby with the bathwater and (unintentionally) renders the notion of truth-making empty.

### 3. Projection Refined

As Smith suggested, I concentrated on the formal part of his account. Unfortunately his explicit definition of truth-making turned out to be no genuine improvement. But we still have Smith's informal characterisation of the idea he tried to spell out; by incorporating a condition of projection he wants to get rid of unwanted cases. This idea indeed is both original and promising, and thus worth to be pursued. In this section I shall present a refinement of Smith's proposal; the major modification consists in a new conception of projection. In formulating this conception I will quantify over properties; I will not defend the legitimacy of this practice.<sup>11</sup>

We have seen that for the present purpose we need a notion of *generic* projection (remember: the truth of (1) requires there being *a* singing sung by Jean, but it does not require the *actual* singing taking place). We have to characterise which *sorts* of things must exist for a given statement to be true; every entity of such a sort can then be said to be generically projected upon by the statement.

Thus, we may say that a statement is *committed to the exemplification* of some property *P* iff the property has to be exemplified for the statement to be true

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<sup>11</sup> Where I use first-order variables ranging over properties, one could alternatively use second-order quantifiers to achieve the same results. If second-order quantification can be lend an innocuous reading (as, for instance, argued for by Rayo & Yablo 2001), the reformulation in second-order idiom would allow those who are suspect of properties to reach my results without ontological costs.

(henceforth I will use the capital letters ‘ $P$ ’ and ‘ $Q$ ’ as variables ranging over properties):

(Df. Com) the statement that  $p$  is committed to the exemplification of  $P \leftrightarrow_{df}$   
 $\square (p \rightarrow \exists y. y \text{ exemplifies } P)$ .

Now, a notion of generic projection can be defined: a statement projects upon all entities having any property that the statement is committed to. More formally put:

(Df. GP) the statement that  $p$  generically projects on  $x \leftrightarrow_{df}$   
 $\exists P [x \text{ exemplifies } P \ \& \ \square (p \rightarrow \exists y. y \text{ exemplifies } P)]$ .

A short reflection, however, tells us that the notion of generic projection just defined is extremely weak: it implies that every statement which has *any* ontological commitments at all generically projects upon anything whatsoever (any existing thing, I may add). The reason is that every thing has some *trivial* property, as for example the property of self-identity. Thus, if a statement that  $p$  implies that there is something, it also implies that there is something self-identical. Since every existing  $x$  is self-identical, it follows by (Df. GP\*) that the statement projects upon  $x$ .

The moral is that if we want a non-trivial notion of projection, we must be a little more exclusive in our choice of properties; not every property should be relevant to projection. So, let us first regard the set that contains all and only those properties to whose exemplification a given statement that  $p$  is committed; I shall use  $s(p)$  to denote this set, whose definition can be formally put as follows:

(Df.  $s(p)$ )  $s(p) =_{df} \{P: \square (p \rightarrow \exists y. y \text{ exemplifies } P)\}$ .<sup>12</sup>

To sort out some properties of this set, we can compare properties in respect to their *grade of specification*. A property  $P$  is *subordinated* to another property  $Q$  iff necessarily everything which exemplifies  $P$  also exemplifies  $Q$ , but not vice versa:

(Df. Subordination)  $P$  is subordinated to  $Q \leftrightarrow_{df}$   
 $\square \forall x (x \text{ exemplifies } P \rightarrow x \text{ exemplifies } Q) \ \&$   
 $\neg \square \forall x (x \text{ exemplifies } Q \rightarrow x \text{ exemplifies } P)$ .

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<sup>12</sup> Strictly speaking, the existence of the set  $s(p)$  is not guaranteed: there might be too many relevant properties to form a set. However, the terminology of a set is only used as a formal device here, which might be replaced by some adequate substitute (instead of sets, we could for instance use classes, mereological sums etc.).

The converse relation can be called superordination:

(Df. Superordination)  $P$  is superordinated to  $Q \leftrightarrow_{\text{df.}} Q$  is subordinated to  $P$ .

Now we can turn our attention to a certain *subclass* of the set  $s(p)$ , i.e. the set of all properties that the statement that  $p$  is committed to. The subclass is defined as follows:

$$m_{s(p)} := \{P: P \in s(p) \ \& \ \neg \exists Q (Q \in s(p) \ \& \ Q \text{ is subordinated to } P) \}.$$

Intuitively we get from  $s(p)$  to  $m_{s(p)}$  by filtering out those properties which are unspecific in regard to  $s(p)$ , i. e. that are superordinated to some other element of  $s(p)$ . Having narrowed down the class of properties in this way, we can define a notion of *specific* generic projection:

(Df. SGP) the statement that  $p$  specifically-generically projects on  $x \leftrightarrow_{\text{df.}}$

$$\exists P (x \text{ exemplifies } P \ \& \ P \in m_{s(p)}).$$

With this notion of projection, statements do not automatically project upon everything there is. That Jean is singing, for example, projects – in the sense defined – upon singings sung by Jean, but not upon singings in general (since *being a singing* is superordinated to *being a singing sung by Jean*) nor upon entities in general etc. It does, by the way, project upon something which *comprises* everything there is: it projects upon the universe. If Jean is singing, there must be a universe, and there is no property more specific than *being the universe* which must be exemplified if Jean is singing. But this need not bother us, since by projecting upon the universe a statement does not *eo ipso* project upon all its *parts*.

So now we can give the following definition of truth-making:

(Df. TMS)  $x$  makes it true that  $p \leftrightarrow_{\text{df.}}$

$x$  necessitates the statement that  $p$ , which in turn projects specifically-generically on  $x$ .

In formula:  $\square (E!x \rightarrow p) \ \& \ \exists P (x \text{ exemplifies } P \ \& \ P \in m_{s(p)}).$

This definition seems to capture what Smith was up to when he invoked the notion of projection for his definition of truth-making. And indeed, it helps against many unwelcome truth-makers: my knowledge that Jean is singing, albeit necessitating (1), does not qualify as a truth-maker of it. It has no property which is included in

the refined set of properties that must be exemplified for the truth of (1). The same holds true for my perceiving of Jean's singing and for the beauty of her singing. And finally we find that by the standards of (Df. TMS), Jean is ruled out as a truth-maker of the equation that  $5+6=11$ .

#### 4. A Sceptical Conclusion

Let me take stock here and see what has been achieved. I have proposed a definition of projection, the combination of which with the notion of necessitation yields a definition of truth-making that throws out some of the unwelcome truth-makers which troubled the pure necessitation approach. However, as I will now argue, not all troublemakers are gone.

Let us first look at necessary statements again. The definition of truth-making reached has the desired consequence that contingent existents do not qualify as truth-makers of arbitrary necessary statements. But notice that still *any necessary existent* will qualify as a truth-maker of any necessary truth. If numbers exist of necessity, then the number 1 will be a truth-maker of, say, the Bolzano-Weierstrass theorem. Perhaps this is tolerable, if we think of numbers as necessary parts of a whole system of interrelated mathematical entities giving rise to a system of truths about them. But there may well be necessary existents of different categories; if, for instance, propositions exist necessarily, then the proposition that bachelors are bachelors will come out as truth-makers of the Bolzano-Weierstrass theorem – which is hardly plausible (recall the two intuitions (Intuition-1) and (Intuition-2) mobilised before: is the Bolzano-Weierstrass theorem true *in virtue* of the proposition that bachelors are bachelors? does this proposition make the theorem true?).

One could, perhaps, deem this result, though not completely satisfactory, still acceptable, if it concerned only necessary statements – they are a league of their own, one might say, and postpone the pursuit of a special treatment for them. But there are still problematic cases which concern *contingent* existents too: think of the singleton of Jean's singing, {Jean's singing}. If its membership is essential to a given set, and if the existence of singleton  $x$  is dependent upon  $x$ ,<sup>13</sup> then {Jean's

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<sup>13</sup> As has been argued for by Fine (1995: 271).

singing} necessitates that Jean is singing. But if, of necessity,  $\{x\}$  exists if and only if  $x$  exists, then any statement specifically-generically projecting upon  $x$  will also project upon  $\{x\}$ . The property of being this singleton must be exemplified, if the statement is true, and there is no property subordinated to this property which must be exemplified also. However, it apparently conflicts with the aforementioned intuitions about truth-making to countenance the singleton of Jean's singing as a truth-maker of (1) (again: is (1) true in virtue of  $\{\text{Jean's singing}\}$ ? does the singleton of Jean's singing make it true that Jean is singing?).

Another sort of problematic cases could arise due to certain second-order tropes. For if we accept such tropes, we should be prepared to acknowledge sorts of second-order tropes such that a given trope must have a second-order trope *of that sort* (though not one *specific* one). Surely, the beauty of Jean's singing is not like that – some singings lack any beauty at all. But there cannot be a singing without, say, volume. So (1) projects upon there being a volume of Jean's singing, and since the volume of her singing also necessitates (1), it qualifies as a truth-maker even on the improved account. But it may conflict with intuitions about truth-making that the volume of Jean's singing should make it true that she is singing.

Even with the refined notion of projection, we have not reached an uncontroversial definition of truth-making then – a rigorous explication of this notion, an explication which captures the intuitions on which friends of truth-making rely, is still wanting. One might, as a result of the problems discussed, begin to wonder whether an explication in terms of necessitation (plus some other notion) is on the right track – and even whether an explication in terms of *modal* terms is promising at all. Modality might be too weak to tell the correct truth-makers from the bad ones; it is perhaps better to endorse the second of the strategies mentioned at the end of section 1, and thus to rethink the roots of the notion and search for an explication in other terms.

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## References

- Evans, Gareth (1982): *Varieties of Reference*, Oxford: Clarendon Press.
- Fine, Kit (1995): 'Ontological Dependence', *Proceedings of the Aristotelian Society* 95 (1995), 269–290.
- Fox, John (1987): 'Truthmaker', *Australasian Journal of Philosophy* 65, 188–207.
- Gregory, Dominic (2001): 'Smith on Truthmakers', *Australasian Journal of Philosophy* 79, 422–427.
- Kim, Jaegwon (1976): 'Events as Property Exemplifications', in: Kim, J. (1993): *Supervenience and Mind*, Cambridge: Cambridge University Press, 33–52.
- Mulligan, Kevin & Simons, Peter & Smith, Barry (1984): 'Truth-makers', *Philosophy and Phenomenological Research* 44, 287–320.
- Rayo, Augustin & Yablo, Stephen (2001): 'Nominalism Through De-Nominalization', *Noûs* 35, 74–92.
- Restall, Greg (1996): 'Truthmakers, Entailment and Necessity', *Australasian Journal for Philosophy* 74, 331–340.
- Rodriguez-Pereyra, Gonzalo (2000): 'What is the Problem of Universals?', *Mind* 109, 255–273.
- Schnieder, Benjamin (forthcoming): 'Truth-making *without* Truth-makers', forthcoming in *Synthese*.
- Smith, Barry (1999): 'Truthmaker Realism', *Australasian Journal of Philosophy* 77, 274–291.
- Smith, Barry (2002): 'Truthmaker Realism: Response to Gregory', *Australasian Journal of Philosophy* 80, 231–234.
- Williamson, Timothy (1999): 'Truthmakers and the Converse Barcan Formula', *Dialectica* 53, 253–270.
- Williamson, Timothy (2000): *Knowledge and its Limits*, Oxford: OUP.