

# Disjunctions, Conjunctions, and their Truthmakers

DAN LÓPEZ DE SA

Gonzalo Rodriguez-Pereyra (2006) argues against attempts to preserve the entailment principle (or a restriction of it) while avoiding the explosion of truthmakers for necessities and truthmaker triviality. In doing so, he both defends the disjunction thesis—if something makes true a disjunctive truth, then it makes true one of its disjuncts—and rejects the conjunction thesis—if something makes true a conjunctive truth, then it makes true each of its conjuncts. In my discussion, I provide plausible counterexamples to the disjunction thesis, and contend that Rodriguez-Pereyra's general defence of it fails. Then I defend the conjunction thesis from Rodriguez-Pereyra's case against it.

A *truthmaker* for a given truth is something in virtue of which the truth is true, see *inter alia* Armstrong 2004. One plausible thesis about truthmaking is that it is closed under entailment, in the sense of obeying the so-called *entailment principle*:

If something makes a certain truth true, then it also makes true all of this truth's consequences.<sup>1</sup>

Though plausible, the principle seems to have some undesirable consequences: the *explosion of truthmakers for necessities*—every thing is a truthmaker for every necessary truth—, and indeed *truthmaker triviality*—every thing is a truthmaker for every truth whatsoever.

Gonzalo Rodriguez-Pereyra (2006) argues against attempts to preserve (perhaps, a restriction of) the entailment principle while avoiding these results. In so doing, Rodriguez-Pereyra crucially both defends the *disjunction thesis*—if something makes true a disjunctive truth, then it makes true one of its disjuncts—and rejects the *conjunction thesis*—if something makes true a conjunctive truth, then it makes true each of its conjuncts.<sup>2</sup>

<sup>1</sup> I here remain neutral on the nature of the truthbearers. Entailment is to be understood here classically. Finally, a thing is a consequence of some things iff it is entailed by them.

<sup>2</sup> Sometimes these labels name the corresponding biconditional claims, here I focus just on the relevant more controversial directions.

In what follows I first provide plausible counterexamples to the disjunction thesis, and contend that Rodriguez-Pereyra's general defence of it fails. Then I defend the conjunction thesis from Rodriguez-Pereyra's case against it. I finally conclude that the envisaged attempts have not been proved, by Rodriguez-Pereyra's considerations, to be at fault.

## 1. Against the disjunction thesis

Suppose that the disjunction thesis is true—that is, that each instance of the following schema holds (see Rodriguez-Pereyra 2006, p. 936):

- ( $\vee$ ) If T is a truthmaker for the truth that  $p$  or  $q$ , then either T is a truthmaker for the truth that  $p$  or T is a truthmaker for the truth that  $q$

Then, assuming that every entity makes something true, truthmaker triviality would follow: every entity is a truthmaker for every truth whatsoever.<sup>3</sup>

The question arises as to whether there are arguments against the disjunction thesis—which dialectically should be independent of the entailment principle. Rodriguez-Pereyra says:

Are there any such arguments? If so, I am not aware of them. (Rodriguez-Pereyra 2006, p. 967)

Fortunately for the defender of (perhaps, a restriction of) the entailment principle, there *are* indeed such arguments—at least, provided certain plausible additional views. For, according to these views, what things there are and how those things are may make a certain disjunction true without making true anyone of its disjuncts.

Take vagueness. Suppose you are confronted with a colour patch, say #35, in the borderline region of a sorites series going from clear cases of red patches to clear cases of orange patches. What things there are and how those things are presumably make true the disjunctive truth that patch #35 is red or orange. But, on plausible views about the nature of vagueness, patch #35 being borderline makes it the case that it is not

<sup>3</sup> Proof: Let T be an arbitrary entity and  $q$  be an arbitrary truth. By assumption, T is a truthmaker of a truth  $p$ . By the entailment principle, T is a truthmaker for the truth that  $q$  or not  $q$ , given that the truth that  $q$  or not  $q$  is entailed by the truth that  $p$ . By the disjunction thesis, T is a truthmaker for the truth that  $q$  or T is a truthmaker for the truth that not  $q$ . But then, given the factivity of being made true, T is a truthmaker for the truth that  $q$ , QED. This is in essence Rodriguez-Pereyra's proof (2006, p. 963), but without invoking the principle that if a disjunction is true then one of its disjuncts is true, which will be important in the discussion below. See also Restall 1996, p. 334 and Read 2000, pp. 71–2.

true that it is red and it is not true that it is orange. Hence, whatever makes the disjunctive truth true fails to make neither of its disjuncts true, for neither *is* true.

Or take open futures. Suppose you toss a coin, say *c*, and the world is such that it is genuinely open whether it will land heads or it will land tails. What things there are and how those things are presumably make true the disjunctive truth that coin *c* will land heads or will land tails. But, on plausible views about the nature of the openness of the future, the fate of *c* being genuinely open makes it the case that it is not true that it will land heads and it is not true that it will land tails. Hence, whatever makes the disjunctive truth true fails to make neither of its disjuncts true, for again neither *is* true.<sup>4</sup>

Certainly, these additional views—about the nature of vagueness, the openness of the future, and the like—here alluded to are, though plausible, also controversial. But I take it that one would expect an argument allegedly trivializing truthmaking (given the entailment principle) not to depend on which view turns out to be the right one on these issues.

Thus there are plausible arguments against the disjunction thesis. Rodriguez-Pereyra, however, offers the following argument in its favour:

Since disjunction is a truth-functional connective, disjunctions have their truth-value fixed by those of their disjuncts. So if  $\langle P \rangle$  is true,<sup>5</sup> the truth of  $\langle P \vee Q \rangle$  is thereby fixed. But the idea behind truthmaker theory is that, in general, alethic facts (i.e. facts about proposition being true) obtain in virtue of non-alethic facts. So if the truth of  $\langle P \vee Q \rangle$  is fixed by the fact that  $\langle P \rangle$  is true, and alethic facts obtain in virtue of non-alethic facts, what  $\langle P \vee Q \rangle$  is

<sup>4</sup>This case is similar to Read's original counterexample to the disjunction thesis (Read 2000), at least on one understanding of it. Suppose there is a horse race, with local conditions etc. being such as to favour Valentine or Epitaph over the other runners, making true that Valentine or Epitaph will win, but leaving genuinely open which of the two will be the winner. This may not reflect Read's intended understanding, however: thus understood, the example also goes against the view that each instance of the following schema holds:

If something is a truthmaker for the truth that  $p$  or  $q$ , then either something is a truthmaker for the truth that  $p$  or something is a truthmaker for the truth that  $q$

Read apparently endorses (see Read 2000, p. 73, Theorem 4.3). Notice also that the sense in which what things there are and how those things are determine that coin *c* will land heads or tails need not be *causal*, so that Rodriguez-Pereyra's criticism of Read (in Rodriguez-Pereyra 2006, pp. 966–7) is clearly ineffective. (If one had doubts about this, just consider a variation of the example involving the disjunctive truth that coin *c* will land heads or *not*—notice that it is in effect with respect to excluded middle that the disjunction thesis is instantiated in the trivializing argument of footnote 3.)

<sup>5</sup>Rodriguez-Pereyra uses angled brackets to form names of propositions, which he takes to be the primary truthbearers.

true in virtue of is what  $\langle P \rangle$  is true in virtue of. So [the disjunction thesis—DLdS] is true: whatever makes a disjunction true makes some disjunct true. (Rodríguez-Pereyra 2006, p. 968)

There are several grounds for dissatisfaction with this argument. First of all, the argument seems to depend on disjunction being a truth-functional connective. What does this exactly amount to? One natural candidate is that each instance of the following schema holds:

$(T_{\vee})$  It is true that  $p$  or  $q$  iff it is true that  $p$  or it is true that  $q$

The left-to-right direction of  $(T_{\vee})$  is, however, problematic: as we have just seen, there are plausible views that contend that, for a number of cases, a disjunction can be true without either of its disjuncts being true—and thus would reject  $(T_{\vee})$  in its full generality.<sup>6</sup>

This notwithstanding, the considered views need not quarrel with the right-to-left direction of  $(T_{\vee})$ —which, despite appearances, turns out to be the only one relevant for Rodríguez-Pereyra's argument. Assume then that if it is true that  $p$  or it is true that  $q$  then it is true that  $p$  or  $q$ . He seems to think that, in that case, if something is a truthmaker for the truth that  $p$  or is a truthmaker for the truth that  $q$ , then it is a truthmaker for the truth that  $p$  or  $q$ . Let it be so.<sup>7</sup> Then whatever makes some disjunct true also makes the disjunction true. But it is clearly a *non sequitur* to move from here to the converse claim that whatever makes a disjunction true makes some disjunct true, as Rodríguez-Pereyra does in the last line of the passage quoted.

Rodríguez-Pereyra's is thus not an effective argument in favour of the disjunction thesis. Are there any such arguments? If so, I am not aware of them.<sup>8</sup>

<sup>6</sup>  $(T_{\vee})$  might still be an important principle, even according to such views, functioning as a constraint that each admissible way of removing the relevant indeterminacies should respect.

<sup>7</sup> This will certainly hold in the presence of the entailment principle.

<sup>8</sup> What about substantially weakening of the disjunction thesis? The following for instance seems capable of sustaining the relevant step in the trivializing argument considered in footnote 3:

$(\vee-)$  If T is a truthmaker for the truth that  $p$  or  $q$ , then—*provided it is true that  $p$  or it is true that  $q$* —either T is a truthmaker for the truth that  $p$  or T is a truthmaker for the truth that  $q$

However,  $(\vee-)$  inherits the concerns one may have with respect to  $(\vee)$ : if something can be a truthmaker for a disjunctive truth and still fail to make true any of its disjuncts, then this can be so even if something *else* makes some of its disjuncts true. For illustration, suppose that the coin lands heads. From this point something makes it true that the coin will land heads—which was previously valueless. This new truthmaker will presumably also be a truthmaker for the disjunction—*certainly* so, in the presence of the entailment principle. But it does not follow, nor it is in any way plausible, that the old truthmaker the disjunction already had when it was still open what the coin would do, now makes it true that it will land heads. (How to spell out the details of this point will,

## 2. In favour of the conjunction thesis

It seems plausible to hold that if something makes a certain truth true, then it also makes true all of that truth's consequences. It has been argued that this entailment principle trivializes truthmaking, by making every entity a truthmaker for every truth whatsoever. But the argument presupposes the disjunction thesis, which we seem to have plausible reasons to reject.

As is well known, the entailment principle also faces versions of the so-called 'paradoxes' of classical implication. For every truth whatsoever entails every necessary truth. Hence, assuming again that every entity makes something true, the explosion of truthmakers for necessities follows: every entity is a truthmaker for every necessary truth.<sup>9</sup>

This result may even be welcomed by some.<sup>10</sup> At any rate, it seems to be far less devastating than the (alleged) trivialization of truthmaking. But suppose one *does* aim to block the explosion. Several strategies for so doing seem available.

One is to reject the entailment principle altogether, and to endorse instead a different, though related, *entailment\** principle—not being the case that every truth entails\* every necessary truth: if something makes a certain truth true, then that also makes true all of this truth's consequences\*. *Pace* Rodriguez-Pereyra (2006, p. 969), this seems to be the one recently favoured by David Armstrong:

The star symbol indicates that if this principle is to be applied in full generality, then the entailment here cannot be classical entailment. ... The exact limitations to be placed on entailment in the suggested [entailment\* principle—DLdS] is a technical matter, one that I am not equipped to discuss. Suggestions have been made by Restall (1996) and Read (2000), and I will simply assume that something is available. I am not arguing that classical entailment should be abandoned, but I am urging that a connective that does

---

of course, depend on the particular view one holds concerning the nature of the primary truth-bearers, as well as on one's position concerning eternalism vs temporalism—issues on which I want to remain neutral here.)

<sup>9</sup> Proof: Let *T* be an arbitrary entity and *q* be an arbitrary necessary truth. By assumption, *T* is a truthmaker of a truth *p*. By the entailment principle, *T* is a truthmaker for the truth that *q*, given that the truth that *q* is entailed by the truth that *p*, QED. See *inter alia* Restall 1996, p. 333; Read 2000, p. 69; Rodriguez-Pereyra 2006, pp. 962–3).

<sup>10</sup> 'There is something quite touching in the view that every particle in the universe (and everything else besides!) is a witness to all necessary truths' (Restall 1996, p. 333), see also Armstrong's reference (2004, p. 11) to a 'Tractarian' view on necessary truths.

not allow the distressing explosion of truthmakers for necessary truths should be used in this particular context. Horses for courses. (Armstrong 2004, p. 11)<sup>11</sup>

Another strategy, however, suggested by Frank Jackson (and also mentioned by Armstrong), is to narrow the scope of the entailment principle. The most obvious option is to restrict it to *contingent* truths. Unfortunately, such a restriction does not suffice by itself to block something like the explosion of truthmakers for necessary truths—at least assuming without restriction that the conjunction thesis is true, that is, that each instance of the following schema holds (see Rodríguez-Pereyra 2006, p. 970):

(&) If T is a truthmaker for the truth that *p* and *q*, then T is a truthmaker both for the truth that *p* and for the truth that *q*

For then every entity which makes something (contingent) true would still be a truthmaker for every necessary truth.<sup>12</sup> On the face of this, Armstrong offers on behalf of Jackson an alternative restriction, to what he calls ‘*purely* contingent truths’, which do not contain any necessary component ‘at any level of analysis’ (Armstrong 2004, pp. 11–12). One other alternative reaction, which I am inclined to think is preferable, is to keep the simpler restriction on the entailment principle to contingent truths, and then restrict the conjunction thesis itself accordingly.<sup>13</sup>

Rodríguez-Pereyra contends, however, that in certain cases at least—involving (‘purely’) contingent truths—, what makes a conjunction true fails to make true some of its conjuncts. If he were right here, these cases would go simultaneously against the Jackson-Armstrong strategy, and against the strategy that I suggested, of restricting the conjunction thesis to contingent truths. And, as he stresses, they would in any case

<sup>11</sup> In footnote 1, ‘entailment’ was stipulated to be *classical* entailment. On some non-classical conceptions, however, some non-classical notion of entailment\* would indeed be the appropriate notion of *entailment*. It is worth exploring, if only for dialectical purposes, the prospects of strategies within the classical framework. As we will see, the discussion to come will prove also relevant for the assessment of Rodríguez-Pereyra’s critical discussion of the non-classical alternatives (2006, p. 976), see below footnote 14. I am indebted here to an anonymous referee for this journal.

<sup>12</sup> Proof: Let T be an arbitrary entity which is a truthmaker for a (contingent) truth *p*; and let *q* be an arbitrary necessary truth. By the entailment principle restricted to contingent truths, T is a truthmaker for the conjunctive truth that *p* and *q*, given that the truth that *p* and *q* is contingent and entailed by the truth that *p*. By the unrestricted conjunction thesis, T is a truthmaker for the truth that *q*, QED. See Restall 1996, pp. 334–5.

<sup>13</sup> This alternative strategy would still have as a consequence that if T is a truthmaker for *p* then T is also a truthmaker for the conjunctive truth that *p* and *q*, where *q* is an arbitrary necessary truth. But this, I take it, is much more palatable than things like the explosion of truthmakers for necessities.

go against the popular conjunction thesis itself. I do not think he is right here, however. Here is his main argument:

Suppose that the conjunction  $\langle$ Peter is man and Saturn is a Planet $\rangle$  is jointly made true by the facts that Peter is a man and that Saturn is a planet. But it is not the case that  $\langle$ Peter is a man $\rangle$  is true jointly in virtue of the facts that Peter is a man and that Saturn is a planet. What  $\langle$ Peter is a man $\rangle$  is true in virtue of is simply the fact that Peter is a man. (Rodriguez-Pereyra 2006, p. 971, emphases removed)<sup>14</sup>

This is puzzling. Certainly, the truth that Peter is a man is true in virtue of the fact that Peter is a man—or so we may suppose, anyway. But how is it supposed to follow from this that it is not then the case that it is *also* true jointly in virtue of the facts that Peter is a man and that Saturn is a planet? In general: why would one think that, if something makes a truth true, then the rest of things, which somehow involve it—as a member, as a part, or whathaveyou—are *not* also truthmakers for the truth?

Actually, one would indeed have thought precisely *otherwise*:

Suppose  $p$  to be a truth and  $T$  to be a truthmaker for  $p$ . There may well exist, often there does exist, a  $T'$  that is contained by  $T$ , and a  $T''$  that contains  $T$ , with  $T'$  and  $T''$  *also* truthmakers for  $p$ . We may say that truthmakers for a particular truth may be more or less *discerning*. The more embracing the truthmaker, the less discerning it is. For every truth, the least discerning of all truthmakers is the world itself, the totality of being. The world makes every truth true, or, failing that, every truth that has a truthmaker true. (Armstrong 2004, pp. 17–18)<sup>15,16</sup>

Of course, one would normally aim at more and more discerning truthmakers for a given truth—ideally, ‘minimal’ truthmakers (Armstrong 2004, pp. 19–23). Hence clearly to *assert* that a more embracing thing is a truthmaker—when another more discerning truthmaker is available—would seem *odd*. Thus intuitions concerning the oddity of

<sup>14</sup> A similar reason is offered involving conjunctive facts instead of pluralities thereof. The other examples provided are: numerically distinct contingent entities  $a$  and  $b$  are not together a truthmaker for the truth that  $a$  exists (Rodriguez-Pereyra 2006, p. 970); the truth that my hand exists is not made true by my body (Rodriguez-Pereyra 2006, p. 978); the truth that Napoleon lost at Waterloo is not made true by the sum of the facts that Napoleon lost at Waterloo and that William won at Hastings (Rodriguez-Pereyra 2006, p. 978). Indeed Rodriguez-Pereyra’s critical discussion (2006, p. 976) of various ways of implementing the alternative strategy involving the entailment\* principle depends crucially on the alleged *desideratum* that, in general, the truth that  $p$  and  $q$  should not entail\* the truth that  $p$ , the motivation of which consists again in the cases considered.

<sup>15</sup> See also the related principle that if something makes a certain truth true, then that thing, together with anything else, also makes it true (Mulligan, Simons, and Smith 1984, p. 316). This feature seems to be, *pace* Rodriguez-Pereyra 2006, p. 973, a general feature of the relation *in virtue of*: see the axiom of *subsumption* in Fine’s (1995) systematization, to the effect that if the  $F$ s are among the  $G$ s then what holds in virtue of the  $F$ s also holds in virtue of the  $G$ s.

saying that the truth that Peter is a man is true in virtue of the facts that Peter is a man and that Saturn is a planet can be nicely accounted for. But, as we know, oddity is compatible with literal truth.

In response to a similar worry, Rodriguez-Pereyra says:

[M]y argument does not take the form: *since* ⟨Peter is man⟩ is true in virtue of the fact that Peter is a man, *then* it is true neither in virtue of the conjunctive fact that Peter is a man and Saturn is a planet nor in virtue of the joint action of the facts that Peter is a man and that Peter is a man and that Saturn is a planet. My argument is that *it is clear that* that in virtue of which ⟨Peter is man⟩ is true is neither the conjunctive fact that Peter is a man and Saturn is a planet nor the facts that Peter is a man and that Peter is a man and that Saturn is a planet taken together, *but simply* the fact that Peter is a man. (Rodriguez-Pereyra 2006, p. 970–1, emphases altered)

Unfortunately, he does not explain why he thinks that it is clear that the more embracing candidates in these cases fail to be truthmakers.<sup>17</sup> I take it that what he is in effect appealing to are merely intuitions concerning the oddity of asserting that they are, in the presence of more discerning truthmakers. But this oddity is of course compatible with their *being* truthmakers, after all. Thus, it seems fair to say, his case against the conjunction thesis has not been substantiated.

## Conclusion

The threat that the entailment principle trivializes truthmaking required the disjunction thesis, which we have plausible reasons to reject. The case against the conjunction thesis, which would also preclude the attempts of blocking the explosion of truthmakers for necessary truths envisaged, does not succeed. I thus conclude that these

<sup>16</sup> Notice that, given the entailment principle, Rodriguez-Pereyra's two arguments for *truthmaker monism*—the view that all truths made true by anything are made true by one and the same entity (Rodriguez-Pereyra 2006, p. 964–5)—depend on the following principle (see Rodriguez-Pereyra 2006, p. 964):

For any entity T, T is *the* truthmaker for the truth that T = T

Unfortunately, no motivation for it is provided and, as just seen, one has reasons to hesitate to endorse the involved uniqueness claim.

<sup>17</sup> He does suggest (Rodriguez-Pereyra 2006, p. 972) that the excess does not 'contribute' to the truthmaking of the more discerning one. But this merely amounts to a re-description of the fact that the more embracing candidates are precisely *more embracing* than other available truthmakers. And hence it does not give any reason for their not being truthmakers. (Incidentally, the contention is true for *any* non-minimal truthmaker, and he does not want to argue against them in general (Rodriguez-Pereyra 2006, p. 979). Any such non-minimal truthmaker would provide a counterexample to the principle in n. 16.)



attempts have not been proved, by Rodriguez-Pereyra's considerations, to be at fault.<sup>18</sup>

ICREA at Departament de Lògica,  
Història, i Filosofia de la Ciència  
Universitat de Barcelona  
Montalegre 6  
08001 Barcelona  
Spain

DAN LÓPEZ DE SA

LOGOS—Grup de Recerca en Lògica, Llenguatge, i Cognició  
Universitat de Barcelona

Arché—The AHRC Research Centre for the Philosophy of Logic, Lan-  
guage, Mathematics and Mind  
University of St Andrews  
dlopezdesa@ub.edu

## References

- Armstrong, David M. 2004: *Truth and Truthmakers*. Cambridge: Cambridge University Press.
- Fine, Kit 1995: 'The Logic of Essence'. *Journal of Philosophical Logic*, 24, pp. 241–73.
- Mulligan, Kevin, Peter Simons, and Barry Smith 1984: 'Truth-Makers'. *Philosophy and Phenomenological Research*, 64, pp. 287–321.
- Read, Stephen 2000: 'Truthmakers and the Disjunction Thesis'. *Mind*, 109, pp. 67–79.
- Restall, Greg 1996: 'Truthmakers, Entailment, and Necessity'. *Australian Journal of Philosophy*, 74, pp. 331–40.
- Rodriguez-Pereyra, Gonzalo 2006: 'Truthmaking, Entailment, and the Conjunction Thesis'. *Mind*, 115, pp. 957–82.

<sup>18</sup> Thanks to the participants of the GAF Blog and The bLOGOS, and to Jiri Benovsky, Joan Pagès, Stephen Read, Gonzalo Rodriguez-Pereyra, Glenda Satne, Benjamin Schnieder, Ezequiel Zerbudis, and an anonymous referee for helpful discussion. Research funded by project HUM2004-05609-C02-01 (MEC) and a GenCat-Fulbright Postdoctoral Fellowship. Thanks to Mike Maudsley for helpful suggestions for amendment.