



Is Truth Made, and if So, What Do we Mean by that? Redefining Truthmaker Realism

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Abstract

Philosophical discussion of truthmaking has flourished in recent times, but what exactly does it mean to ‘make’ a truth-bearer true? I argue that ‘making’ is a concept with modal force, and this renders it a problematic deployment for truthmaker theorists with nominalist sympathies, which characterises most current theories. I sketch the outlines of what I argue is a more genuinely realist truthmaker theory, which is capable of answering the explanatory question: In virtue of what does each particular truthmaker make its particular truthbearer(s) true? I do this by drawing on recent work by Frederik Stjernfelt on Charles Peirce’s account of the proposition as having a ‘particular double structure’, according to which a proposition not only depicts certain characters of an object, it also depicts *itself* claiming those characters to pertain to the object. This double structure, I shall argue, also resolves important issues in analytic philosophers’ truthmaker theory, including the proper distinction between reference and truthmaking, and a dilemma concerning an infinite regress of truthmaking.

Keywords Truth · Truthmaker · Proposition · Realism · Nominalism · Peirce · Stjernfelt · Icon · Index · Dicisign

1 Introduction

Truthmaking has been widely discussed of late, and even described as “one of the most important metaphysical topics of the late 20th-century and early 21st-century

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philosophy” (Rodríguez-Pereyra 2006a, p. 186), although pioneers such as Armstrong and Fox held that they were merely developing an idea pervasive in Western philosophy since Aristotle.¹ But what exactly does it mean to ‘make’ a truth-bearer true? Making seems to be a notion with modal force: it supports counterfactuals. To claim that A ‘makes’ B is to claim, *ceteris paribus*, that if A did not make B then there would be no B. I shall argue that this modal force has been insufficiently appreciated, and this has significant consequences for using truthmaker theory as a support for *realism*,² although not in ways usually thought of.

Although truth-‘making’ is often assumed to support realism, Sami Pihlström has usefully noted that it might just as well be deployed to explicate various forms of antirealism. To address this, I shall perform conceptual analysis on the notion of philosophical ‘explication’. I shall distinguish what I will call *nominalist* and *realist* explications – suggesting that where the former ‘bottoms out’ in brute statements of identity, the latter highlights principles with explanatory force. I shall then return to truthmaker theory and endeavour to explicate it realistically in these terms, focusing specifically on its postulated *truthmaking relation* between truthbearers and the world, and asking: *In virtue of what does each particular truthmaker make its particular truthbearer(s) true?*

I shall consider three answers to this question, which I shall dub Descriptive, Indexical and Iconic Models of truthmaking, then claim that none can account for the simultaneous structure and unity of the proposition. I will then turn to recent work by Frederik Stjernfelt on Charles Peirce’s notion of the proposition (or “Dicisign”), and suggest that it offers some fruitful new ways of thinking about how a genuinely realistic account of truthmaking might look, finishing with some thoughts about philosophical realism considered in a general sense.

2 Truthmaker Theory vs. Deflationism

A truthmaker for a true sentence (*p*) was influentially defined by Armstrong as something the very existence of which necessitates *p* (Armstrong 2004, p. 6).³ But how can a *thing* necessitate the truth of a *sentence*? The relation appears to be puzzlingly *cross-categorical*.⁴ Over time further issues have emerged with this definition – for instance it doesn’t work for necessary truths under classical logic.⁵ Other difficult issues have concerned what might necessitate *negative facts* such as “There are no

¹ See (Armstrong 1997, p. 13 and 2004, p. 4), and (Fox 1987, p. 188).

² By *realism* here I mean a certain ‘broad church’ version of the view that in spite of its extreme generality has in recent decades been influential in analytic metaphysics, particularly in “Australian realism” as developed by Armstrong (e.g. 1978; 1989) and his key (‘honorary Australian’) interlocutor David Lewis. This realism’s clearest and most definitive claim is arguably a negative one – the avoidance of “some sort of pragmatism or idealism”, as John Bigelow remarks below. That this realism has been a guiding light in truthmaker theory can be seen in claims such as Greg Restall’s “Australian Realists are fond of talking about *truthmakers*” (Restall 1996, p. 331). There are of course many ways in which realism so broadly conceived may be disambiguated. One way is realism about universals or scholastic realism, and in this paper I advance this interpretation both because I see it as – ironically – relatively untried by truthmaker realists, and because I believe it enables me to do interesting theoretical work.

³ See also (Fox 1987, p. 189).

⁴ This is apart from certain special cases where propositions make other propositions (or themselves) true.

⁵ This has led some to suggest using relevant logic instead (Restall 1996), while others express scepticism about that (Simons 2008, p. 13).

unicorns”, or *universal facts*, such as “All cats have whiskers” (Mulligan et al. 1984; Armstrong 2004, pp. 53–82).

Nevertheless, many truthmaker theorists have believed that they are capturing a crucial *realist intuition*: our sentences must correspond in a determinate manner with ‘bits of the world’, or else we are just engaging in loose talk (or at best in some language-game which is merely *expressive*). Thus John Bigelow famously wrote:

...I have sometimes tried to stop believing in the Truthmaker axiom. Yet, I have never really succeeded. Without some such axiom, I find I have no adequate anchor to hold me from drifting onto the shoals of some sort of pragmatism or idealism (Bigelow 1988, p. 123).

How does truthmaker theory anchor realism? Arguably by enabling a schematic yet important *explanation* for why truths are true. Thus “Snow is white” is not merely true in some random or primitive fashion, it is true because snow exists, and is white. As David Lewis puts it, “truths must have *things* as their subject matter” (Lewis 1992, p. 218). It must be conceded here, though, that there has been argument over whether truthmaker theory supplies an argument for realism, or vice versa, and metaphysicians have been advised that they can’t have it both ways (Beebe and Dodd 2005; Tahko 2013, 2016).

A natural enemy of truthmaker theories, which rejects the necessity of Bigelow’s anchoring move, is *deflationary* (or “redundancy”) *theories of truth*, frequently characterised by two claims:

- i) Truth is not a substantial property.
- ii) The key to our use of the concept of truth lies in its disquotational character:

“p” is true iff p.⁶

Although Armstrong has argued that one can have both a truthmaker and a deflationary theory of truth by holding that truthmaker theory provides the “ontology” of truth, while deflationism takes care of the “semantics” (Armstrong 1997, p. 128), this overlooks the fact that deflationism is usually understood as claiming that the “disquotational” semantics of truth is not only correct, but *all* there is to say about truth.⁷

3 Truth-‘Making’ and Realism

So far we seem to face a stark choice between an account of truth that is realist because ontologically robust – truthmaker theory – and an account of truth that is antirealist

⁶ This formulation is derived from (Price 1998, p. 41).

⁷ For argument that the standard division into ‘metaphysical’ and ‘deflationary’ accounts of truth constitutes a false dichotomy, see (Legg 2014).

because ontologically minimalist – deflationism. But Sami Pihlström has astutely pointed out (Pihlström 2005) that the alignment is not necessarily so straightforward, since the notion of ‘making truth’ has equally been deployed by pragmatists in a constructivist, ‘world-making’ sense. For instance, William James in his 1907 pragmatism lectures somewhat notoriously argued that truths are ‘*made*’ rather than *found*, and “Truth is *made*, just as health, wealth and strength are made, in the course of experience” (James 1907, p. 104). F.C.S. Schiller further extended this thinking by including in his 1907 collection *Studies in Humanism* essays entitled “The Making of Truth” and “The Making of Reality”. Lest these philosophical moves seem the effusions of an alien tradition, in the heart of analytic philosophy Nelson Goodman also developed a principled irrealism about truth in *Ways of Worldmaking* (1978).⁸

Having created conceptual space for understanding truthmaker theory as an account of human-made truth, Pihlström argues that it is better to interpret the theory thus, by outlining some *prima facie* serious problems for Armstrong’s allegedly realist (explicitly non-constructivist) account. For instance, Pihlström asks how the allegedly necessary relation between truth-bearer and -maker (Truthmaker Necessitarianism) might square with Armstrong’s professed naturalism (Pihlström 2005, pp. 125–6). He also asks what might serve as the truthmaker for the truthmaking relation itself, given that we presumably want to say that it is *true* that white snow truthmakes “Snow is white” (Pihlström 2005, p. 125). This poses something of a dilemma: if we say that the above is not true, we seem to undermine the objectivity – and thus the point – of truthmaker theory, and if we say that it is true, we seem to create an infinite regress requiring a further truthmaker for the truth that “Snow is white” is made true by white snow...and so on. (Another way to explore the same issues might be to ask whether the truthmaking relation is *reflexive*.)

It seems that more specificity is needed if we wish to position truthmaker theory as a realist explication of truth. Perhaps we could qualify our claim that truthbearers are made true by distinguishing: ‘made true *by the world*’ – a realist claim – from ‘made true *by us*’ – an antirealist claim.⁹ Here it is tempting to draw on our earlier definition of a truthmaker as something the very existence of which necessitates that a sentence is true, to define realist truthmaker theory as claiming that truthbearers are ‘made true by something *that exists*’. However that won’t do – and the proposed realist side of the distinction is correspondingly revealed as ambiguous – for don’t we exist?

We now appear to reach something of an impasse between realist and antirealist explications of truthmaking. Yet I don’t believe this issue is irresolvable. My argument will follow a somewhat uncharted course through the landscape of discussion in this area, by aligning realism with a certain understanding of realism about universals, and antirealism with a certain understanding of nominalism. I shall argue that this alignment is fruitful in revealing that most truthmaker theory developed so far has been nominalist in spirit, thereby opening up the possibility of a more deeply realist truthmaker theory which is so far unconsidered. So I will now explore the general nature of philosophical

⁸ Only one contemporary analytic truthmaker theorist seems to have had an inkling of this possibility: Barry Smith, who writes, “Truthmakers, like visual fields, are cognition-dependent entities which exist only as a result of certain sorts of cognitively effected demarcations of reality” (Smith 1999, p. 289). See also (Smith 1992).

⁹ Another interesting distinction to explore could be that between ‘made true by us’ and ‘made by us’. I am grateful to an anonymous reviewer for this suggestion.

explication, presenting ‘nominalist’ and ‘realist’ understandings of it, before in section 5 arguing that standard versions of truthmaker theory are all more or less nominalist in spirit.

4 Two Models of Philosophical Explication

Although debates between nominalists and scholastic realists were (in both ancient and medieval times) extraordinarily complicated and hedged with a variety of hybrid and middle positions, one very broad line of argument counterposes a kind of *nominalism*, which seeks to reduce general predicates, such as ‘– is white’ either to some number of particular white things, or (in the case of Ockham) to particular mental acts of apprehending whiteness,¹⁰ to a kind of *realism* which considers general predication to be *sui generis*, despite the more complex ontology that this forced realists to develop and defend. Drawing on this contrast, I will distinguish two broad kinds of philosophical explication, which I shall refer to as explication ‘in a nominalist spirit’ and ‘in a realist spirit’. (I have chosen to use the term ‘explication’ here rather than ‘analysis’ or ‘explanation’ in order to leave open whether the process is a priori or a posteriori.) I will call what is explicated a ‘phenomenon’, which is just intended to be as ontologically neutral a term as possible.¹¹

4.1 Explication in a Nominalist Spirit: Explication as Identity

To explicate a phenomenon (‘X’) in a nominalist spirit is to locate (or postulate) *an entity, or set of entities*, with which X may be *identified*. A notable example is David Lewis’ project of “Humean supervenience”, which has the following manifesto:

It is the doctrine that all there is to the world is a vast mosaic of local matters of particular fact, just one little thing and then another (Lewis 1986a, p. ix).

One notorious application of this is Lewis’ analysis of *modality* (Lewis 1986b), which claims that the possibility that I could be an opera singer can be identified entirely with the fact that in another possible world there *exists* a certain entity - a counterpart of me who *is* an opera singer.

That Lewis calls his view “modal realism” is somewhat confusing with respect to the medieval conception of realism on which I am drawing, since Lewis can be categorized as a modal nominalist in the particularity of the existents into which he believes modality may be analysed without residue.¹² Leaving that aside, though, Lewis also applies Humean supervenience-style explications to causation, laws of nature, mental phenomena, and other traditional metaphysical topics.

¹⁰ Likewise, see the “semantic” defence of nominalism in (Devitt 1980).

¹¹ It is neutral, that is, amongst the plethora of ontological forms currently posited and discussed in analytic metaphysics – such as objects, events, states of affairs, properties, tropes, facts, and more.

¹² Lewis’ possible worlds are maximal sums of spatiotemporally related concrete particular objects (Lewis 1986b, p. 86).

4.2 Explication in a Realist Spirit: Explication as Explanation

On the other hand, to explicate X in a realist spirit is to *provide general principles of which X-like phenomena are a special case*. Consider Robert Nozick's elegant account of knowledge in terms of "tracking the truth" (Nozick 1981). Here a notoriously difficult philosophical concept is explicated via a quite different and extensively theorised concept – counterfactual dependence. Consider also Plato's account of the desire to do philosophy in terms of a kind of intellectual *eros*, which locates becoming attracted to philosophy within a much wider pattern of felt attraction. One sign of a good realist explication is that it possesses further explanatory power. So, for example, one might think that if philosophy is a form of love, it should follow that when one praises the loved object to people who do not share that love, they will never quite 'get' what one is talking about.

When realist explications are so understood, we may note that only they have modal force and are thus *explanations*. Only they can generalise into new situations to deliver new insight. Particulars don't generalise. ("Clark Kent is Superman" – end of story.) Moreover, the identity-based nature of nominalist explication implies that there is only one fundamental or ultimate explication of a given phenomenon, whereas a phenomenon can receive different realist explications which are equally successful on their own terms. (If a bridge collapses, one might explicate this by noting a structural weakness, or a heavily-loaded truck passing over, and both may be genuine explanations, although in certain contexts one may be more salient.)

By these lights Armstrong often comes out as explicating reality and truth in a nominalist spirit. For he is fond of ontological reductions, claiming that all reality supervenes on a foundation of "physical entities governed by no more than the laws of physics", so that common sense properties such as whiteness are but 'second-class' (Armstrong 1997, pp. 6–14). Could it be correct to accuse Australia's most famous defender of universals of nominalism?¹³ Yet Armstrong has noted that one of his guiding metaphysical aspirations is to live up to the claim of Wittgenstein's *Tractatus*, that "all facts are first-order facts" (Armstrong 1997, p. 2). Due to a shift in emphasis from using One-Over-Many arguments to using truthmaking to argue for his realist metaphysics, and a corresponding shift from universals to states of affairs, which are logically particular,¹⁴ Armstrong arguably *has* shown a gradual slide towards nominalism across his career.

Some metaphysicians might wish to claim that nominalist and realist explications are ultimately equivalent in some important sense, for so-called 'general principles' are nothing but dispositions, the categorical grounds of which will be existents.¹⁵ Thus it will be argued that *all* explication reduces ultimately to identity claims. However this begs the question in favour of nominalism as I have just characterised it, so for now we shall try to leave this question open.

¹³ For an argument that Armstrong is in fact a "nominalistic Platonist" see (Legg 2002).

¹⁴ See (Armstrong 1997, p. 126) for "The Victory of Particularity" with respect to first-order states of affairs, although they contain universals as constituents.

¹⁵ Armstrong himself heads in this direction (Armstrong 1997, chapter 5).

5 Truthmaker Theory as Nominalist Explication

Truthmaker theorists have so far mostly sought to explicate truth in a nominalist spirit (in my sense) insofar as they take themselves to be engaged in an *ontological* search – for existents which may be in some sense *identified* with the truth of truthbearers – namely truthmakers. Thus in 1984 Mulligan, Simons and Smith wrote (taking a particularly naturalistic approach):

We remain convinced that it is possible to develop a theory of the truth-relation which appeals only to objects firmly tied into our ordinary and scientific experience. For it is in such experience, and not in the abstract models of logical semantics, that there lie the origins of our knowledge of truth and falsehood (Mulligan et al. 1984, p. 318).

At the same time, some truthmaker theorists do not search for truthmaking existents: a minority movement advocates ‘truthmaking without truthmakers’. One key proponent, Hornsby, explains that it is useful “to think of truthmaking even if there are no entities which make propositions true” (Hornsby 2005, p. 33). Another is Melia, who claims to provide “a way of accounting for certain sentences without having to postulate the entities that the statement seemed to refer to” (Melia 2005, p. 75). But Melia claims that his motivation also stems from nominalism, although in this case he is not seeking to reduce general properties, but to postulate fewer individuals. This interesting position will be discussed further below.

A further symptom of nominalism in contemporary truthmaker theorists is their approach to the truthmaking *relation*. John Fox, whose discussion of truthmaking links fruitfully with medieval metaphysical debates, notes that holding nominalism naturally leads philosophers to some form of truthmaker theory, while at the same time it discourages them from assigning the truthmaking relation any reality:

...scholastic nominalism tended to agree with the formulation of the correspondence theory [of truth]. But they equated its ‘relation’ of correspondence with its adequate basis...no further entity, no ‘formal’ relation of correspondence, is required for the judgement to be true” (Fox 1987, pp. 200-1).

Other truthmaker theorists grant the relation *some* ontological status, but try to deflate that status as much as possible. Armstrong’s approach here is well-known: although he acknowledges that the truthmaking relation exists, he claims that it is *internal*, and thus “not something over and above its terms”, and “no addition of being” (Armstrong 2004, p. 9). For this reason, famously, he dubs it an *ontological free lunch*. Both approaches – eliminativist in Fox’s case and reductionist in Armstrong’s – are nominalist in spirit.

It is interesting to reflect on the significant influence that Wittgenstein’s *Tractatus* has had on many truthmaker theorists.¹⁶ Although Wittgenstein himself never used the term ‘truthmaker’, the *Tractatus* arguably exemplifies nominalistic impulses

¹⁶ See for instance, (Armstrong 1997, p. 3). Wittgenstein also profoundly influenced Russell, who is credited as a truthmaker forefather by Armstrong, and Mulligan et al.

regarding truth in a particularly pure form.¹⁷ For instance, Wittgenstein claims that theorising the relation between his atomic states of affairs and their corresponding atomic propositions is *impossible*, at least in propositional form:

4.12 Propositions can represent the whole of reality, but they cannot represent what they must have in common with reality in order to be able to represent it – logical form (Wittgenstein 1961).

This remark highlights a tension between the truthmaker theorist’s supposedly realist intuition that every true sentence must have a truthmaker, and the truthmaker theorist’s supposedly realist intuition that the truthmaking relation is real. Holding both claims simultaneously seems to create a kind of ‘Third Man’ regress, with truths requiring truthmakers to explain them, and truthmakers requiring truths about their functioning to justify them, to infinity.

I have now argued that standard truthmaker theories seek to explicate truth in a nominalist spirit, which creates some tension within the view. In the next section I shall argue that this tension undermines their ability to deliver the reassurance metaphysicians such as Bigelow are hoping for.

6 Truthmaker Theory as a ‘Modal Free Lunch’

It was earlier noted that ‘making’ is a notion with modal force. Although truthmaker theories differ in many ways over the connection’s exact nature and strength,¹⁸ all purport to support counterfactuals of something like the following form: “If x [the truthmaker] did not exist, then p [the truthbearer] would not be true”.

Yet there is an important difference between truth-‘making’ and more common-organ ‘makings’. Consider sunshine melting snow. One can ask, “By virtue of what does sunshine make snow melt?”, and one can answer, “by virtue of its warmth”. Warmth is a general property with a wide range of effects of which its effect on snow is a special case. So this is a realist explication. Similarly, one can ask, “By virtue of what do mother cats make kittens, not puppies?”, and one can answer, “By virtue of feline DNA.” In the senses I have outlined above, this second explication has both nominalist elements (identifying a set of particular complex molecules as *the* cause of kitten morphogenesis) and realist elements (detailing the systematic growth patterns that these molecules produce, by virtue of their structure).

Now consider the question, “By virtue of what does the truthmaker for ‘snow is white’ make that sentence true?” It might be retorted, “By virtue of its whiteness!” This answer will not do, however, because not all white objects truth-make ‘snow is white’. Consider white *paper*, for instance. Analogously, the answer, “By virtue of its being snow” is not sufficient because of *black* (i.e. polluted) snow. Rather, there is an important sense in which the truthmaker for “Snow is white” *is* the truth of the

¹⁷ For explicit recognition of this see (Skyrms 1981), which Armstrong acknowledges in a number of places has greatly influenced him.

¹⁸ From the apparent (albeit opaque) material implication of the early Wittgenstein, to the strict implication of (Rodríguez-Pereyra 2006a, p. 188), and positions which do not fall into either camp such as (Linsky 1994).

sentence. *Explicator* and *explicandum* are identical. Such an explication has no predictive power and supports no counterfactuals, except of the degenerate form, “If the truthmaker for ‘snow is white’ had not existed then ‘snow is white’ would not have been true”. Such counterfactuals are, however, a mere tautology within truthmaker theory. For, as we have already noted, this is explication in a nominalist spirit, and lacks modal force. Yet the use of the term “make” in the name “truthmaker” suggests otherwise.

For this reason I would argue that the problem with much current truthmaker theory is not that it is a nominalist explication per se, but that it is *a nominalist explication masquerading as a realist one*. Rather than “truth-making theory”, a more appropriate name would be “truth-being theory”. This, label, however, unfortunately lacks the comforting ring to realists of “truth-maker” theory, where one imagines that the world somehow *brings it about* that one’s true sentences are true – although we make truthbearers, it is in virtue of the world that they are true or false. To put the same point another way, nominalist truthmaker theory collapses into an Identity Theory of Truth.¹⁹

We have seen that Armstrong claims that supervening entities constitute an ‘ontological free lunch’. Analogously, I shall introduce the term *modal free lunch*. This is sought when an explication of some phenomenon is offered as an *explanation* when it is actually an *identity*. So, I am claiming that standard (nominalist) truthmaker theory seeks a modal free lunch. Truthmaker theorists may object that their theory does not need to be explanatory, for all they are doing is providing the *ontology* of truth, and explanation is an *epistemological* matter. Yet this is arguably in tension with the profound explanatory justification for realism that so many truthmaker theorists have claimed. The move also seems to smack of desperation. If a theory is not explanatory *at all*, why should a philosopher spend valuable time and energy framing it? The next section further expands these points.

7 Truth as Brute Dyadic Relation

Despite the many fascinating differences between specific truthmaker theories, we can summarise a certain common ground in a ‘no-name brand’ truthmaker theory which makes the following three claims: i) There are truthbearers. ii) For each truthbearer there is at least one truthmaker.²⁰ iii) Some relation connects truthbearers with truthmakers, thereby ‘making’ the former true. So far, the truthmaking relation is postulated as a brute, dyadic relation.

A crucial explanatory gap faced by this brute dyadic approach can be exposed by asking: *Why should we care about this two-place relation?* There are many possible

¹⁹ Armstrong comes close to admitting this when he acknowledges that supervenience relation between truthmakers and truthbearers is *symmetrical* (Armstrong 2004, p. 8). This is not the usual understanding of supervenience. This point is expanded on at (David 2005, p. 147). David does also qualify that Armstrong explicitly repudiates the Identity Theory of Truth, giving a citation to support this (David 2005, p. 155). But the citation is to Armstrong’s 1973 book *Belief, Truth and Knowledge*, and we have already noted that Armstrong’s views evolved significantly through his career.

²⁰ This claim does assume the view known as *Truthmaker Maximalism*. But (Milne 2005 notwithstanding) without it there seems little point in a truthmaker theory, as once one allows some truthbearers to lack truthmakers, one must devise an alternative explanation for *their* truth, and why then can’t such an account be developed for all truthbearers?

two-place relations between language and the world – why this one? Why do we aim for truth and not for T^* , which matches every true sentence with a particular grain of sand in the Sahara desert? (There will be some overlap in sentences per grain, of course, but so is there with truthmaking and things in the world). Or why not T^{**} , which takes the original truth-relation and matches every truthmaker with the truthbearer which is next in English alphabetical order? This is Putnam’s famous “model-theoretic” argument against metaphysical realism (Putnam 1981) in new dress.

Why do we care about truth? A plausible if extremely general answer goes something like: “True sentences give us access to the way things are”. (Note that this answer invokes “the way things are”, not just “the things that are”.²¹) This highlights fundamental features of our ordinary language concept of truth which are not guaranteed by T ’s brute dyadic relation. For instance, the relation must be *stable*: “Snow is white” cannot be truth-made by white snow on Tuesdays and green cars on Wednesdays. Our brute dyadic relation does not rule out such stability, but neither does it *ensure* it, and this seems somehow unsatisfying. Consider an analogous claim: that *gravity* is a two-place relation – a set of ordered pairs, each denoting one falling object and a number corresponding to its acceleration in a particular context. Such a claim is not *false*, but one feels that the essence of the matter has been missed: that all gravitational accelerations are describable in a general principle, expressible mathematically, which possesses extensive predictive power.

We have seen that it suits nominalist truthmaker theorists to treat the truthmaking relation as metaphysically transparent, or ‘internal’, effectively resting in an Identity Theory of Truth. I submit that a genuine realist would like some further explanations. She would like to ask: *In virtue of what does each truthmaker make its truthbearer(s) true?* Since the topic of truthmaking rose to prominence, there has been a wealth of discussion of the truthmaking relation’s nature and logical features. Is it a brute necessary connection (Bigelow 1988; Armstrong 1997, 2004), or some kind of supervenience (Lewis 2001), or more recently, grounding (Schaffer 2008)? Is it *one-one* (Restall 1996; Armstrong 2004, p. 11), *maximal* (Armstrong 2004, p. 7), (Milne 2005; Schaffer 2008), or *minimal* (Armstrong 2004, pp. 19–23)? Yet despite all this detailed investigation, no-one appears to have considered the ‘in virtue of’ question above. Yet this is arguably one of the most important questions of all. Answering this question would presumably throw significant light on the *nature* of truth, providing valuable ammunition against deflationism. I shall now briefly explore three different possible answers – the truthbearer *describes*, *indexes*, and *pictures* the truthmaker.

8 Three Possible Explications of the Brute Dyadic Relation

8.1 The Descriptive Model

The first answer is that a truthmaker truthmakes a truth-bearer by virtue of the latter providing a sufficiently good *description* of the former. This answer is modelled on

²¹ Others have made this point – see for instance Lewis’ correction of Quine: “I want to construe ‘being’ broadly: it covers not only *whether* things are, but *how* they are” (1992, p. 218). How this irenic claim fits with Lewis’ Humean Supervenience manifesto is not entirely clear. See also (Cameron 2008; Schaffer 2008).

Russellian²² definite descriptions, whereby objects are picked out by virtue of properties they possess, and where property and property-bearer part ways, the reference tracks the property, not the (ex-)bearer (e.g. “The Prime Minister of Australia”). Such phrases are easily transformable into propositions with truth-values, Ramsey-style, by adding an existential quantifier (e.g. “Something is the Prime Minister of Australia”).

Such a conception of reference is fundamental to a Frege-Russell-Quine tradition in philosophy of language, and through the idea of Ramsey-sentences has been influential in recent analytic metaphysics (Lillehammer and Mellor 2005; Jackson 1998). The Descriptive Model seems to be what is envisaged by (Mulligan et al. 1984) who describe their preferred truth-makers (“moments”) as “existing dependent or non-self-sufficient objects” which require the existence of other objects in order to exist, such as “the lifting of the accident victim into the ambulance” (Mulligan et al. 1984, p. 290). They explicitly cite definite-description-era Russell as an inspiration (Mulligan et al. 1984, p. 296).

Restall also seems to invoke the Descriptive Model when he states:

Firstly, think of a unicorn. Necessarily, if that unicorn exists, then the claim ‘a unicorn exists’ is true. So a unicorn is something whose existence would necessitate the claim ‘a unicorn exists’ (Restall 1996, p. 332).²³

Here, “a unicorn exists” seems to be a kind of Ramsey sentence, as if the creature in question ceased being a unicorn, it would no longer truthmake the sentence, even if it still existed (e.g. as a shape-shifting cat). This model arguably points us to a way of resolving a contested issue in truthmaker theory. The *necessitation* frequently attributed to the truthmaking relation often makes it seem as though certain key properties of the truthmaker must be *essential*, in ways that seem puzzling. For example it has been suggested that snow must be essentially white in order to properly truthmake “Snow is white” (because to the degree that snow is possibly orange, its truthmaking of “Snow is white” lacks legitimacy). Yet snow is clearly not essentially white! So we have a problem.²⁴ Perhaps this troublesome apparent demand for truthmaker essentialism rather signals that the truthmaking is in some important manner being performed by the ‘essence’ (i.e. property) itself.

8.2 The Indexical Model

My second suggested model holds that truthmaking consists in the truth-bearer somehow *indexing* the truthmaker. This model also looks to Russell – this time to what he called a “logically proper name”. This concept has been extended beyond Russell’s

²² “Russellian” should here be understood in a broad sense indicating not every detail of the doctrine adumbrated in “On Denoting” so much as the sweeping influence of these ideas through twentieth century philosophy of language (*albeit* amended by later philosophers such as P.F. Strawson, who noted that descriptions such as “the F” need not uniquely refer to count as “definite”).

²³ Here the point might have been more clearly made if Restall had said that a unicorn is something whose existence necessitates *the truth of* the claim “a unicorn exists”, since the mere existence of an entity does not necessitate that anyone *claim* that that entity exists. I am grateful to an anonymous referee for pointing this out.

²⁴ Truthmaker essentialism is adumbrated in (David 2005, p. 144). (Parsons 1999) discusses but ultimately denies it. The above should not be taken as endorsing truthmaker essentialism as a plausible view, merely as acknowledging its presence in the literature.

application of it solely to sense-data particulars (Russell 1985, pp. 61–3), most influentially by Kripke. Kripke points out that in certain cases where I only know the meaning of a name such as “Saul Kripke” through a property – such as “the author of *Naming and Necessity*” – if the property and name-bearer part ways (if Kripke didn’t actually author *Naming and Necessity*, but someone else did), then “Saul Kripke” still tracks Kripke himself, as that is his name (Kripke 1980, pp. 83–92).

Truthmaker theorists often seem to talk tantalisingly *as if* an Indexical Model is how they envisage the truthmaking relation. It might be argued that such an account is not plausible if we understand a truthmaker as something the existence of which *necessitates* the truth of the truth-bearer. How can a named object necessitate anything? However this arguably treats necessitation too much like deducibility, whilst necessitation is, properly regarded, *purely metaphysical*. Thus a possible model for necessitation under the Indexical Model is precisely the identities around which we have seen that nominalist explication often turns. This seems to be precisely how Armstrong is thinking (Armstrong 2004, p. 9), as a way to resolve the cross-categorical nature of his own truthmaking relation.

But I will now present a third – relatively unexplored – model of “correspondence” between truthmaker and truth-bearer.

8.3 The Iconic Model

This model takes as its paradigm representing *relations* through an isomorphically structured sign, as geographical relationships are represented by a map, holding that truthmaking consists in the truth-bearer somehow *picturing* the truthmaker. This model has not been much considered by truthmaker theorists²⁵ – it would seem because it naturally pertains to diagrammatic representation rather than the linguistic representation they have generally focussed on. Yet there is no principled reason why truthmaker theory must restrict itself to linguistic representation.

There is actually an intriguing representative of this model in Wittgenstein’s *Tractatus*. Wittgenstein, who chose his words with notorious care, referred to the relation between atomic propositions and the states of affairs he postulated as their truthmakers as *picturing*:

2.19 Logical pictures can depict the world...

2.21 A picture agrees with reality or fails to agree; it is correct or incorrect, true or false.

Although Wittgenstein’s choice of the term “picturing” has been widely considered gnomic and unhelpful, he was here arguably attempting to distinguish an Iconic Model of truthmaking from its cousins.

Wittgenstein’s atomic states of affairs comprise objects whose natures enable them to combine ‘like the links of a chain’. Atomic propositions can truly describe these states of affairs by ‘picturing’ their logical structure.²⁶ Although much scholarship has been devoted to the nature of Wittgenstein’s objects, a close reading of the *Tractatus*

²⁵ although see (Smith and Murray 1981)

²⁶ “2.12: the picture is a model of reality” (Wittgenstein 1961).

suggests that Wittgenstein did not consider this question very important. In fact he even suggests that reference to particular objects can drop out of a complete theory of the world,²⁷ thereby suggesting that where truth proper resides is in his objects' *arrangement* into logical pictures.

It might be argued that the Iconic and Descriptive models are equivalent. Doesn't the latter pick out aspects of the world in terms of *properties* they possess, and the former pick out *relations* they bear to one another, and isn't a property just a one-place relation? But the two models differ not merely in *what* is represented but in *how* it is. In the Iconic Model, each sign may be understood through its structure to *intrinsically* signify a particular relation, whereas the correspondence between predicates and properties under the Descriptive Model is generally merely conventional. (Compare a map of Australia, which signifies iconically by virtue of its shape, with the descriptive word "cat".) It was arguably this 'intrinsicity' of iconic signs that led Wittgenstein to embrace his Picture Theory of Meaning.

To sum up, we now have three different possible models of the structure and operation of the truthmaker relation. Which, if any, is correct? I shall now suggest that the three models are all as they stand insufficient, but nevertheless serve as crucial conceptual components for a more richly structured model, which I shall outline and then recommend. To the extent that our account of truthmaking will now become even more structured, we will plunge further into truthmaker theory that is realist in the sense I have been arguing for.

9 Beyond the Dyadic Relation

To develop this more fully realist truthmaker theory I draw on recent original work by Frederik Stjernfelt on Peirce's theory of propositions (Stjernfelt 2014, 2015). In his later writings, Peirce substituted the term "*Dicisign*" for "proposition" in many places, in order to indicate that his theory of the proposition encompasses more than just linguistic sentences (Stjernfelt 2015, p. 1022).

9.1 A "Particular Double Structure"

First of all, it is important to recognise the fundamental difference between propositions and terms, which renders the former an entirely new level of semantic functioning. Whereas a referring term merely picks out something in the world, a proposition can be true or false – it conveys *information*. For this reason, where some philosophers of language have held semantic compositionality, others such as Frege have held that terms are best understood as 'propositional functions'. This so-called 'priority of the propositional' has even been considered a distinguishing feature of post-Fregean analytic philosophy.²⁸

²⁷ "5.526: We can describe the world completely by means of fully generalized propositions, i.e. without first correlating any name with a particular object" (Wittgenstein 1961).

²⁸ Robert Brandom concurs, placing the insight within his distinctive inferentialism by categorising it as the smallest unit of meaning for which we can take *responsibility* (Brandom 2000).

What enables propositions to rise to this ‘next level’? In a key advance on our brutally dyadic truthmaker relation, rather than being merely paired off in *reference* or *correspondence* pairs between words and world, propositions possess an internal structure with a distinctive representational form. A proposition is a sign which *says something about something*, or, more specifically: “[a] proposition is a sign which separately, or independently indicates its object.” (Peirce 1998, p. 307). This gives the proposition what Stjernfelt calls a “particular double structure”. This structure is not descriptive, indexical or iconic per se. Rather, in Peircean terms, it consists in an index and an icon *fused together* so that something is both picked out and described at the same time. Stjernfelt explains:

One and the same complex sign—the Dicisign—in some way indicates an object... and at the same time, furnishes a description of that object given in the predicative...aspect of the Dicisign (Stjernfelt 2015, p. 1026).

As Peirce puts it:

...every proposition is a compound of two signs, of which one functions significantly, the other denotatively. The former is intended to create something like a picture in the mind of the interpreter, the latter to point to what he is to think of that picture as being a picture of (Peirce 1905, p. 43).

Consequently it is no coincidence that most propositions in Indo-European languages have the grammatical structure *Subject* and *Predicate*. For all the rich analysis of ‘logical features’ of the truthmaking relation in the literature – such as entailment and conjunctive principles (Rodriguez-Pereyra 2006a, b), reflexivity, symmetry and transitivity (Schaffer 2008) – no-one seems to have thought of mining this structural feature of propositions for truthmaking insight. Returning to our familiar example of “Snow is white”, Peirce states that the true sentence’s relation to the white snow is twofold: it picks out the snow *and* describes it simultaneously. Yet this does not mean that each Dicisign has the following two *objects*: i) a particular (or set of particulars), ii) a property or universal predicated of it – in this case: i) snow, ii) whiteness. We shall see shortly that although each Dicisign does have two objects, they are more complicated (and interesting) than this.

It’s worth noting that a sign does not require explicit subject-predicate grammatical structure in order to function as a proposition. A *photograph* can qualify:

The photograph’s indexical connection to its object via focused light rays stemming from the object, influencing a photographic plate...plays the Subject role of the Dicisign, granting the connection of reference...while the shapes, colours and other qualities formed on that plate play the Predicate role...(Stjernfelt 2015, p. 1025).

But there must be some double structure in order for the Dicisign to convey information, or it will degenerate either into simple pointing (index-only signification), or what Peirce calls a “vague dream” (icon-only signification).

9.2 The Dicsign's Two Objects

But we have not yet plumbed the radical difference of Dicsign theory from standard twentieth century accounts of the proposition.²⁹ We can approach that by asking: How do the index and the icon combine to convey information? This is a question about the Dicsign's *syntax*, and how it functions. Stjernfelt's reply is as follows: "The Predicate not only depicts certain characters of the object, it also depicts the Dicsign claiming those characters to pertain to the object" (Stjernfelt 2015, p. 1026):

The syntax claims that the Dicsign is really indexically connected to the real fact to which the Subject and Predicate correspond. What is often taken to be the function of the copula, Peirce instead analyses as an index connecting the tokens of the Subject and the Predicate respectively, in the sign (Stjernfelt 2015, p. 1031).

This claim is deep and difficult but very important. The claim is that the Dicsign's very combination of subject and predicate indexes relevant (isomorphic) ontological structure. So just as "– is white" is predicated of "snow" in "Snow is white", this syntactic relationship in the Dicsign *indexes* the way that whiteness is instantiated by snow in the world.³⁰

This means that the Dicsign's two objects are actually as follows. The first is the state of affairs referred to (in our case: *white snow*). The second is "the very reference relation of the Dicsign to that [first] object" (Stjernfelt 2015, p. 1033) – that is, *the way in which* that Dicsign says something about the first object – that is, the way in which "Snow is white" picks out white snow. This means that there is a recursive character to Dicsigns, according to which, as Stjernfelt puts it:

...the syntax of the Dicsign connecting its two parts mirrors (1) that of the combination of its real object and its alleged property into a [state of affairs], as well as (2) the indexical relation which the Dicsign claims to exist between itself and its object" (Stjernfelt 2015, p. 1034).

The syntax of the typical English Dicsign ultimately reduces to the way that words which denote subject and predicate are placed together in a linear sentence. This syntax rests on linguistic *co-localization*, which provides a (simple, abstract) *picture* or *icon* of the corresponding worldly state of affairs. In that sense, Wittgenstein's Picture Theory of Meaning is vindicated. But (arguably the most original and challenging part of

²⁹ Stjernfelt distinguishes Peirce's account from that of Frege, Russell and Wittgenstein at (Stjernfelt 2015, p. 1031). See also (Stjernfelt 2016).

³⁰ Peirce arguably expresses this point when he says, "The most perfectly thorough analysis throws the whole substance of the Dicsign into the Predicate." (Peirce 1931-58 2.318). One might protest that such a move robs the Dicsign's subject of all meaning, which cannot be correct. But this depends what one means by 'meaning'. The subject retains a pure indexing role with regard to the Dicsign's first object, which is its proper function. Meanwhile, the predicate, properly analysed (which may not correspond exactly to the proposition's 'surface grammar') assumes the entire iconic signification. There is a further important story to tell, which must be postponed to another time and place, about how these icons and indices are mobilised to co-function by an overall *interpretation* which counts as a *symbol* in Peirce's sign-theory. I am grateful to challenges from an anonymous referee on these points.

Dicisign theory) it is precisely that iconic structure that enables the Dicisign to *index* the isomorphic state of affairs. So Wittgenstein would have been even more correct if he had defined a “Picture-Pointing Theory of Meaning”.³¹

Stjernfelt claims that co-localization “seems to form a primitive, pre-linguistic syntax” (Stjernfelt 2015, p. 1032), speculating that human languages evolved from simple placing of objects and sounds together physically, into the rich grammatical structures we see today. Our grammar still has co-localization at the root of its functioning, he claims, although it has ramified into a series of “conventionalizations”. A simple example is a portrait with attached name (N), where if N is placed *underneath* the portrait, the Dicisign conventionally identifies the sitter, and if placed *inside* the portrait, it conventionally identifies the painter. Nevertheless, in both cases it is placing the name *with* the portrait spatially that creates a proposition which is true or false.

9.3 Real Truthmaking and Reflexivity

The Dicisign’s recursivity arguably holds the key to resolving the dilemma of the *reflexivity* (or not) of the truthmaking relation that troubles nominalist truthmaker theory. Stjernfelt claims that the Dicisign’s double structure blurs the distinction between object and meta-language by operating at both levels simultaneously (Stjernfelt 2015, p. 1026). How? Just in the way that, as noted, the predicate simultaneously depicts certain characters of the object *and* depicts the Dicisign’s own claim that those characters pertain to that object, thereby serving as its own index to the (truth-making) fact in question. Packing both functions into the one truthbearer enables us to account for how it is *true* that white snow truthmakes the sentence “Snow is white”, without triggering the infinite regress which was presented earlier. To review: the regress may be posed as a dilemma. Should we say that it’s *true* that white snow truthmakes “Snow is white”? If we say no, our truthmaker theory doesn’t seem to be worth much. If we say yes, we seem to require a further truthmaker for the truth that “‘Snow is white’ is made true by white snow’, and whatever that truthmaker (T) is, we then face the question, ‘Is it true that T truthmakes the statement that white snow truthmakes “Snow is white”?’...and so on. Now, the Dicisign’s second object blocks the demand for T, because reference (object 1) and truthmaking (object 2) are two different functions performed by the proposition itself.³² We see here a structural explanation of the truthmaking of “Snow is white” replacing the positing of a further (truthmaking) entity – this is therefore a realist solution in my sense.

To sum up, then, it seems that Dicisign theory offers useful tools for explicating truthmaking in the realist spirit which I have outlined. This explication eschews merely postulating truthmaking *entities* – rather, it provides a general account of truthmaking *structure* – which nonetheless provides explanations which are genuinely new. For instance, Peirce’s account of the way in which index and icon fuse to convey

³¹ Or, even better, a “Picture-Pointing Theory of the Meaning of Propositions”, since the meanings of terms and arguments require a different analysis. I am grateful to John Bishop for incisive discussion on this point.

³² A final objection at this point is that it seems perverse to think that the proposition is made true, not by white snow, but by its own semiotic relationship with white snow. But is this really perverse? Why? Isn’t some sort of ‘semiotic relationship’ between proposition and fact precisely what is wanted in a truthmaker? Here I urge the astute reader to be careful not to beg the question for the nominalism that I have suggested runs through much previous truthmaker theory.

information creates a rich framework for further explicating the simultaneous structure and unity of the proposition.

9.4 Answers to Objections

A Peircean account of truthmaking is novel, and philosophers schooled in standard approaches may well have questions. Firstly, the nominalistically inclined may remark, “It is all very well to talk of ‘structures’, but what *are* they, metaphysically speaking? You are here bloating our ontology with mysterious entities – which is surely antinaturalistic!” The reply is that we are not postulating *entities*, but *functional principles*, and in interpreting otherwise the nominalist begs the question in favour of his own identity-based philosophical explication.

Secondly, it might be argued that the account seems fair enough for standard (“positive”) subject-predicate sentences like “Snow is white”, but does it have anything to say about standard problem-cases for truthmaker theory such as negative and universal truths? I don’t think that this problem is insoluble, it is just necessary to think about ways in which negation and universal quantification might be *iconised*. For instance, negation might be conceived as putting some kind of separating ‘wall’ between two concepts – for instance placing the Universe (or ‘our possible world’) on one side, and unicorns on the other.³³ Having explicated negation, universal statements such as $(\forall x)Ux$ (“Everything is a unicorn”) might be explicated in terms of existence and negation in the standard manner: $\sim(\exists x)\sim Ux$ (“Nothing is not a unicorn”).

Relatedly, this theory enables a distinction between a proposition’s *reference* and its *truthmaking*, as the Dicsign’s first and second object. We have seen some truthmaker theorists explicitly warning not to conflate truthmaking with reference – the “truthmaking without truthmakers” flag-wavers Melia and Hornsby. So far, we applaud these theorists. But in their principled avoidance of reifying truthmakers, they have avoided giving *any* theoretical account of truthmaking. This leads Melia for instance to merely gesture at *how* he considers language connects with the world.³⁴ The realist approach seeks – and I have argued, is able to provide – more information than this.

10 Conclusion

Are truthbearers *made* true? And if so, what do we mean by that? We want what is true to depend on the world *and* we want an account of how that is the case. A truthmaker theory should provide both. Nominalism has always been ill-suited for such a task.

We have seen that *making* is a concept with modal force. It supports counterfactuals, and thus explanations. For this reason I have argued that it should be viewed in a realist light, and nominalist truthmaker theorists are illicitly seeking a ‘modal free lunch’. I have suggested that a certain nominalist philosophical explication consists in

³³ This is exactly what happens in Peirce’s graphical logic system, the Existential Graphs, with the so-called ‘cut’ which represents negation. For further details, see (Roberts 1973).

³⁴ “Consider ‘there are three ways in which Joe could win his chess match.’...What makes the quantified sentence true is nothing more than that $\diamond P$ and $\diamond Q$ and $\diamond R$ ” (Melia 2005, p. 84).

establishing identities between particular things, while a realist explication provides principles which enable counterfactual reasoning and, thus provide explanatory power beyond the situation at hand. Why not try for the realist explication, if it can be had? (Of course, if one believes that it can't be had, it surely won't be.)

We saw that Wittgenstein ruled the truthmaking relation unexplainable in principle, writing:

4.12 Propositions can represent the whole of reality, but they cannot represent what they must have in common with reality in order to be able to represent it – logical form.

In one sense, Peirce's theory manages to achieve what Wittgenstein said was impossible – enabling the Dicisign to represent what it has in common with reality – in the form of the Dicisign's second object. Yet in another sense it doesn't, since we have seen that the Dicisign's structure *iconises* the worldly fact, rather than presenting it discursively. In Tractatarian terms, we might say that the Dicisign's second object still *shows*, rather than *saying*, what it has in common with reality. So it all depends what one means by 'represent'. But then again, we have now seen that that 'showing' is not *purely* iconic, but takes a hybrid icon-index form. The need for this indexical dimension is something Wittgenstein arguably missed – although it is arguably evident in the ordinary language concept of 'showing', where, for instance, showing my friend my cellphone involves not just allowing him to passively see its outlines, but bringing it to him, *pointing it out*.

This paper has been written in the hope that redefining truthmaker realism might have implications for redefining realism more generally. Contemporary analytic philosophy has recently seen a tidal wave of nominalism. Even the scholastic realists are nominalists.³⁵ Yet why should philosophers be ashamed to seek further explanations?

References

- Armstrong, D. M. (1978). *Universals and Scientific Realism (2 Vols.)*. Cambridge: Cambridge University Press.
- Armstrong, D. M. (1989). *A combinatorial theory of possibility*. Cambridge: Cambridge University Press.
- Armstrong, D. M. (1997). *A world of states of affairs*. Cambridge: Cambridge University Press.
- Armstrong, D. M. (2004). *Truth and Truthmakers*. Cambridge: Cambridge University Press.
- Beebe, H., & Dodd, J. (Eds.). (2005). *Truthmakers: The contemporary debate*. Oxford: Oxford University Press.
- Bigelow, J. (1988). *The reality of numbers: A Physicalist's philosophy of mathematics*. Oxford: Clarendon Press.
- Brandom, R. (2000). *Articulating reasons: An introduction to Inferentialism*. Cambridge: Harvard University Press.
- Cameron, R. P. (2008). Truthmakers and ontological commitment: Or how to deal with complex objects and mathematical ontology without getting into trouble. *Philosophical Studies*, 140(1), 1–18.
- David, M. (2005). Armstrong on Truthmaking. In H. Beebe & J. Dodd (Eds.), *Truthmakers: The contemporary debate*. Oxford: Oxford University Press.
- Devitt, M. (1980). Ostrich nominalism' or 'mirage realism. *Pacific Philosophical Quarterly*, 61(4), 433–439.

³⁵ Armstrong's philosophy has been discussed in this regard above. See also David Lewis, "New Work for a Theory of Universals" (Lewis 1983).

- Fox, J. F. (1987). Truthmaker. *Australasian Journal of Philosophy*, 65(2), 188–207.
- Goodman, N. (1978). *Ways of Worldmaking*. London: Hackett.
- Hornsby, J. (2005). Truth without Truthmaking entities. In H. Beebe & J. Dodd (Eds.), *Truthmakers: The contemporary debate*. Oxford: Oxford University Press.
- Jackson, F. (1998). *From metaphysics to ethics: A Defence of conceptual analysis*. Oxford: Oxford University Press.
- James, William. (1907). Pragmatism: A new name for some old ways of thinking, published (1975) in *Pragmatism and the Meaning of Truth*. Cambridge: Harvard University Press.
- Kripke, S. A. (1980). *Naming and necessity*. Cambridge: Harvard University Press.
- Legg, C. (2002). Predication and the problem of universals. *Philosophical Papers*, 30(2), 117–143.
- Legg, C. (2014). Charles Peirce's limit concept of truth. *Philosophy Compass*, 9(3), 204–213.
- Lewis, D. (1983). New work for a theory of universals. *Australasian Journal of Philosophy*, 61(4), 343–377.
- Lewis, D. (1986a). *Philosophical papers volume II*. Oxford: Oxford University Press.
- Lewis, D. (1986b). *On the plurality of worlds*. Cambridge: Cambridge University Press.
- Lewis, D. (1992). Review of Armstrong A combinatorial theory of possibility. *Australasian Journal of Philosophy*, 70(2), 211–224.
- Lewis, D. (2001). Truthmaking and difference-making. *Noûs*, 35, 602–615.
- Lillehammer, H., & Mellor, H. (2005). *Ramsey's legacy*. Oxford: Oxford University Press.
- Linsky, B. (1994). Truth-makers for modal propositions. *Monist*, 77(2), 192–206.
- Melia, J. (2005). Truthmaking without Truthmakers. In H. Beebe & J. Dodd (Eds.), *Truthmakers: The contemporary debate*. Oxford: Oxford University Press.
- Milne, P. (2005). Not every truth has a Truthmaker. *Analysis*, 65(287), 221–224.
- Mulligan, K., Simons, P., & Smith, B. (1984). Truth-makers. *Philosophy and Phenomenological Research*, 44(3), 287–321.
- Nozick, R. (1981). *Philosophical explanations*. Cambridge: Harvard University Press.
- Parsons, J. (1999). There is no 'Truthmaker' argument against nominalism. *Australasian Journal of Philosophy*, 77(3), 325–334.
- Peirce, C.S. (1905). *Manuscript 284* [unpublished].
- Peirce, C.S. (1931-1958). *Collected Papers*. In C. Hartshorne, P. Weiss and A. Burks (Eds.) (8 vol.s). Cambridge: Harvard University Press.
- Peirce, C. S. (1998). Essential Peirce. In N. Houser & C. Kloesel (Eds.), *Selected Philosophical Writings (1893–1913)* (Vol. 2). Indianapolis: Indiana University Press.
- Pihlström, S. (2005). Truthmaking and pragmatist conceptions of truth and reality. *Minerva – An Internet Journal of Philosophy*, 9, 105–133.
- Price, Huw. (1998). "Three norms of Assertibility", in J. Tomberlin, ed. *Philosophical Perspectives* 12, 41–54.
- Putnam, H. (1981). *Reason, truth and history*. Cambridge: Cambridge University Press.
- Restall, G. (1996). Truthmakers, entailment and necessity. *Australasian Journal of Philosophy*, 74(2), 331–340.
- Roberts, D. D. (1973). *The existential graphs of Charles S. Peirce*. Berlin: de Gruyter.
- Rodriguez-Pereyra, G. (2006a). Truthmakers. *Philosophy Compass*, 1, 186–200.
- Rodriguez-Pereyra, G. (2006b). Truthmaking, entailment and the conjunction thesis. *Mind*, 115(460), 957–982.
- Russell, B. (1985). In D. Pears (Ed.), *The Philosophy of Logical Atomism*. La Salle: Open Court.
- Schaffer, J. (2008). Truthmaker commitments. *Philosophical Studies*, 141(1), 7–19.
- Simons, Peter. (2008). Why the negations of false atomic sentences are true. In T. De Mey & M. Keinänen (eds.), *Essays on Armstrong*. Acta Philosophica Fennica, 84, 15–36.
- Skyrms, B. (1981). Tractarian nominalism. *Philosophical Studies*, 40(2), 199–206.
- Smith, B. (1992). Characteristica Universalis. *Language, Truth and Ontology* (Kluwer), 48–77.
- Smith, B. (1999). Truthmaker realism. *Australasian Journal of Philosophy*, 77(3), 274–291.
- Smith, B., & Murray, D. (1981). Logic, form and matter. *Proceedings of the Aristotelian Society, Supplementary*, 55, 47–74.
- Stjernfelt, F. (2014). *Natural propositions*. Boston: Docent Press.
- Stjernfelt, F. (2015). Dicisigns. *Synthese*, 192(4), 1019–1054.
- Stjernfelt, F. (2016). Dicisigns and habits: Implicit propositions and habit-taking in Peirce's pragmatism. In D. West & M. Anderson (Eds.), *Consensus on Peirce's concept of habit: Before and beyond consciousness* (pp. 241–262). Cham: Springer.
- Tahko, T. (2013). Truth-grounding and transitivity. *Thought*, 2(4), 332–340.
- Tahko, T. (2016). Armstrong on Truthmaking and realism. In F. F. Calemi (Ed.), *Metaphysics and Scientific Realism: Essays in Honour of David Malet Armstrong* (pp. 207–218). Berlin: De Gruyter.

Wittgenstein, L. (1961). *Tractatus Logico-Philosophicus*. trs. D.F. Pears & B.F. McGuinness. London: Routledge.

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