

**Sort of but Sort of Not:
The Theory of
Metaphysical
Indeterminacy**

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The candidate confirms that the work submitted is his own and that appropriate credit has been given where reference has been made to the work of others.

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Abstract

This thesis is an investigation into metaphysical indeterminacy. The project initially aims to scope out the available options for token theories, and to clarify the choice between them in a systematic manner. Following a meta-theoretical excursion concerning the target and motivation for such theorizing, I then move on to provide a comparative and systematic framework for the discussion of the nature of indeterminacy. That model's utility is then exemplified by its ability to distinguish some variants of Supervenience. Finally, some of the foregoing is utilized to reply to some arguments that seek to derive metaphysical indeterminacy from semantic indeterminacy. The project then moves on to discuss distinctively *metaphysical* indeterminacy, and it is shown how the previous model can be straightforwardly fleshed out to model the options. I subsequently move on to critically engage with three extant substantive proposals from the literature about the nature of metaphysical indeterminacy.

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Introduction

Philosophers are worried: “Tolerance is a problem” they say, “it leads to defective borders, and threatens us all.” No, I’m not confusing philosophers with UKIP – as far as I know, they’ve got nothing to do with indeterminacy, though if they did I’m sure there’s a quick argument for a paraconsistent analysis. No, the philosophers in question are worried about *vagueness* – that class of terms that seem susceptible to sorites paradoxes. Vagueness, it seems, is one particularly troubling example of indeterminacy – a plausibly broader, but equally puzzling phenomenon. This thesis is all about indeterminacy, and theories thereof. In particular, the goal is to investigate the theory of *metaphysical* indeterminacy – to understand what such a theory could look like. This is the idea that *the world itself* (rather than our representations of it) could be somehow or other ‘unsettled’. The suggestion that time might ‘branch’ is the by now familiar idea that reality ‘forks’ across time. The idea of ‘metaphysical indeterminacy’ (at least under some developments) can be glossed as a generalization of the idea of branching time: that reality might also ‘synchronically branch’ too. In a slogan, metaphysical indeterminacy is what happens when the world forks up.

Rather than defending a particular theory of metaphysical indeterminacy, the ambition is to peer under the bonnet of theories of the nature of indeterminacy, and thus to scope out the available options, indicating what the choice between them consists in.¹ The hope is that this inherently comparative approach will give greater insight into what a theory of metaphysical indeterminacy *is*, and to provide a

¹ I’ll assume throughout that we should be realists about the phenomenon of indeterminacy, and won’t consider the viability of, say, expressivist or conventionalist accounts, whatever such may be.

sufficiently detailed recipe to develop hitherto unexplored or undefended token theories. I will then begin sorting between those theories by engaging with some prominent substantive theories amongst them – those with defenders in the extant literature - and thereby hopefully illustrate some of the hurdles that such accounts face.

The first two chapters are concerned not with constructing a theory of indeterminacy, then, but with the meta-theoretical task of (a) outlining a theory neutral-account of the target of any such theorizing, and (b) clarifying the space of options which token theories might occupy, by identifying some important dimensions over which such theories disagree.

In the first chapter I seek to get clear on the basic phenomena that seem to constitute the phenomenon of indeterminacy, with an eye to outlining a functional characterisation of the concept of indeterminacy. Additionally, I seek to outline the explanandum of a theory of *metaphysical* indeterminacy, in a manner satisfactory to sceptics.

In the second chapter I get to work on outlining what an account of the *nature* of indeterminacy might look like. I develop an abstract formal model that I claim is suitably generic enough to accommodate various substantive theories. Moreover, I aim to illustrate the utility of that model by employing it to distinguish some importantly distinct varieties of supervaluationism. Finally, I seek to further utilize those prior distinctions to undermine some recent efforts to argue for metaphysical indeterminacy on the back of semantic considerations.

In the third chapter I engage with the nature of *metaphysical* indeterminacy. There I show how we can derive theories of metaphysical indeterminacy from the general model previously offered,

thereby illustrating its structural similarities with non-metaphysical theories – and so its legitimacy as indeterminacy *proper* – as well as some unexplored options. Then, I move on to critically engage with several extant accounts, united by their shared classicist ambitions, in a bid to begin choosing between those options.

Chapter 1

What is a ‘Theory of Metaphysical Indeterminacy’?

The overall aim of this thesis is to survey some of the options one faces in constructing a ‘theory of metaphysical indeterminacy’, and to point out how we might begin choosing between them. But what *is* such a theory? Any such theory comprises, *inter alia*, answers to the following questions – questions that can be asked about indeterminacy in general (metaphysical or otherwise):

- (i) What *is* (metaphysical) indeterminacy? What is its *nature*?
- (ii) *Why* is there (metaphysical) indeterminacy? What is its *source*?
- (iii) Where does (metaphysical) indeterminacy *manifest*? What sorts of thing are *loci* of indeterminacy?²
- (iv) How ought we *reason* about (metaphysical) indeterminacy? What is an appropriate *logic* for indeterminacy?
- (v) How does (metaphysical) indeterminacy impact upon *semantics*? Relatedly, what sort of semantics and meta-semantics should we give of indeterminacy-theoretic locutions?
- (vi) How does (metaphysical) indeterminacy impact upon *pragmatics*? How does it impact upon how our assertions are normed?
- (vii) How do we *know* anything about the phenomenon of (metaphysical) indeterminacy? Relatedly, how do we know about particular instances of (metaphysical) indeterminacy?

² The distinction between (i), (ii), and (iii) will be discussed in the next chapter.

- (viii) What sorts of *cognitive attitudes* ought we have in the presence of (metaphysical) indeterminacy? How does it impact upon how our cognitive attitudes are normed?
- (ix) What can (metaphysical) indeterminacy *do* for us? What is its theoretical utility? Is it useful enough to be worth positing?³

These questions are, of course, instances of a generic set of questions that goes some way to characterising what it is to be a *philosophical theory tout court*. For instance, a theory of *justice*, or a theory of *causation*, or whatever, ought to answer these sorts of questions about their respective explananda – to give a philosophical explanation of any phenomena is to engage with just these sorts of questions.⁴ Our concern, then, is to explore the territory of such theories with regard to the phenomenon of *metaphysical indeterminacy*.

1.1 The Explanandum (part 1): Indeterminacy

Prior to giving a theory of some phenomenon we first need to narrow in on the explanandum: to characterise the phenomenon that is the target of our theorising. In short, we need to say *what our theory is a theory of*.

We can achieve this in three ways:

- (i) Ostensively, by pointing to putative examples of the phenomenon (cases that we seek to diagnose as instances of our explanandum);

³ It is the answer to this last question, I think, which is best considered to amount to a specification of the ‘theoretical role’ of metaphysical indeterminacy. That being said, there’s a legitimate broader sense, in which the ‘theoretical role’ might be constituted by the answers to any number of questions (i)-(ix). I’ll use it in the narrow sense, unless otherwise indicated.

⁴ There’s of course a perfectly legitimate sense in which answers to only some of these questions constitutes ‘a theory’, albeit a partial one – indeed, the term ‘theories of vagueness’ often gets applied to a set of answers to (ii)+(iv)+(v)+(ix), and sometimes even to just things of sort (ii)+(iv) alone.

- (ii) By way of a theoretically neutral description that falls short of a full conceptual, metaphysical, or semantic analysis.⁵ This may include uncontroversial logical, semantic, cognitive, or metaphysical principles that are universally agreed to characterise the phenomenon;
- (iii) By pointing to central puzzles or paradoxes that we would expect a theory to speak to. This is particularly important: we could ask many of the philosophical questions above of tons of phenomena, but the reason we focus upon some explananda rather than others is because some of them seem somehow *problematic* in this sense. As such, the puzzles and paradoxes often form the primary *motivation* for theorising in the first place.

Each of these aims to get the phenomenon in the crosshairs – and to that extent, meeting each is required for giving an extensionally adequate theory of the phenomenon.⁶

⁵ The relevant neutrality here concerns that between competing substantive theories of metaphysical indeterminacy primarily – in other words, to avoid begging any questions with regard to answers to (i)-(viii). The exception to this is question (ix): see the next footnote for discussion.

⁶ Specifying (iii) amounts to a partial specification of the theoretical role of (metaphysical) indeterminacy. But, can't substantial theories disagree over its theoretical role (i.e. question (ix))? Clearly they can. However, there are some such roles – some core puzzles & problems – which seem so *core* to the phenomena that denying that it *is* its job to help answer them carries a *burden* to explain why we're mistaken in thinking so. For example, there's a very strong intuition (which seems universally shared) that vague terms are (in some sense) indeterminate, and it seems thereby quite intuitive that indeterminacy must be somehow relevant to solving the sorites paradox. It's open to a theorist of indeterminacy to *deny* that indeterminacy is so intertwined with vagueness, but it seems like that surprising result incurs them a burden to explain why we ever thought that. By contrast, theorists might disagree over whether indeterminacy has a theoretical role in explicating causation, but anyone who denies such doesn't seem to have a corresponding burden to explain why it doesn't play that role – and that's why it doesn't feature in the specification of the *explanandum* of indeterminacy, even if it might partly constitute its theoretical role.

The general rationale for characterising the explanandum is three-fold. First, it helps to secure genuine disagreement between substantial theories, by ensuring that all those theories are targeting the same phenomenon. Second, the combination of these three tasks provides us with some adequacy conditions on any substantive theory of the phenomenon, and so goes some way to ensuring a level playing field on which such substantive theories can compete by offering a mutually agreeable measure against which such theories can be compared. Third, they serve to partly address those sceptical of the phenomenon – especially those who express incredulity about the very target of such theorising. I’m thinking here not just those who accuse metaphysical indeterminacy of being conceptually incoherent – rebutting *that* is a matter of providing a coherent substantive theory. Rather, the aim is to address those whose concern is that they ‘have no idea what you’re even talking *about*’ – and that, I take it, is a request for some minimal specification of the explanandum of a theory of metaphysical indeterminacy.

So, if we’re going to give a theory of metaphysical indeterminacy, we should begin with a clear statement, in as theoretically neutral a manner as we can, of what sort of thing we mean by ‘metaphysical indeterminacy’. We can split this into two tasks: that of characterising *indeterminacy*, and that of characterising *metaphysical* indeterminacy. I’ll take these in turn.

Before that though, it’s worth commenting on similar discussions in the literature on *vagueness*.⁷ There are two projects here, which Smith (2008) nicely labels as that of giving a ‘surface characterisation’ and that of giving a ‘fundamental definition’. Roughly, the former corresponds to giving a

⁷ I’m not always faithful to the extant literature throughout, in that I sometimes treat the author as discussing indeterminacy rather than vagueness – often because there’s an obvious analogous position about indeterminacy, and its excessive to always qualify. Also, please excuse that in some cases, for the purposes of exposition, I will lapse into talking about vagueness.

relatively superficial extensional characterization of the phenomenon; the latter an account of the ‘nature’ or ‘constitution’ of vagueness – a theory of what vagueness *is* (i.e. an answer to question (i) above). The crucial difference between these two tasks, as I see it, is that a fundamental definition, unlike a surface characterization, has an *explanatory duty* - it has to explain *why* the symptoms of vagueness (which collectively characterize it) manifest at all - more explicitly, to posit and justify relations of explanatory priority⁸ between those symptoms, and possibly other phenomena. The latter task, of giving a ‘surface characterisation’, is all I’m after here.

As Smith notes, the task of a giving a ‘fundamental definition’ (*viz*, an answer to question (i)), need not be neutral in the way that characterising the explanandum should be. With regard to *vagueness*, Eklund (2005), and Smith (2008) are very much in the vein of a ‘fundamental definition’, whilst Greenough (2003) and Bueno & Colyvan (2006) are more an attempt at characterizing the explanandum, as is Williamson’s (1994) ostensive characterisation. Greenough’s (2003) dismissal of soriticality as insufficient on the grounds of its being a *mere symptom* of vagueness should not be understood as the demand that a neutral characterization *itself explain* soriticality – that would push it into the realm of a fundamental definition - but rather as the claim that the neutral characterization should treat vagueness, however fundamentally defined, as having the *explanatory role* of accounting for soriticality. The important point for us, here, is that

⁸ There are two distinct tasks here, depending upon whether we’re giving an explication of the phenomenon itself or of our *concept* of it, and as such whether by ‘explanatory priority’ we mean metaphysical or conceptual priority. Answers to these questions don’t obviously need to mirror one another: for example, one might think that vagueness (the phenomenon itself) is metaphysically explained by tolerance-like phenomena, but nevertheless think that the *concept* of vagueness is conceptually prior to the concept of tolerance. (Of course, it’s not even clear that these two tasks don’t themselves splinter: asking which concept is ‘conceptually prior’, for instance, will amount to a number of different tasks depending upon which notion of ‘concept’ is at issue).

while a characterization of the explanandum needn't provide explanations, it should identify the explanatory *role* – both of the things that need explaining about the phenomenon, and of the things that it itself seemingly explains. In effect, the following thereby seeks to identify the explanatory role of indeterminacy.

1.1.1 Ostensive characterization

We can ostensively characterize a phenomenon directly or indirectly. Indirectly, we do so by pointing to various *symptoms* that we think evidence an instance of the phenomenon. Directly, we point to *explicit examples*.

1.1.1.1 Symptoms

Linguistic symptoms: Indeterminacy is foremost evidenced in the existence of various natural language locutions used to indicate our hesitance about certain matters – hesitance about whether a term applies in some case, or about whether a particular sentence is true, or about whether some particular state of affairs obtains. Consider, for instance, the age-old dilemma about whether a Jaffa Cake is a biscuit.⁹ When posed this question, many are inclined to offer answers such as these¹⁰:

'It's indeterminate'

'It's indefinite'

'It's unclear'

'It's vague'

'It's borderline'

⁹ Other borderline-cases of 'biscuit' are available.

¹⁰ Some naïve sorts advert to the legal ruling on this matter to answer the question, but more astute types of course recognize that the question is properly posed as one about the ordinary English term 'biscuit', not its legal counterpart, and that most of the time we don't find ourselves in a sufficiently legal context – let's call it 'the courtroom' – in which the legislative ruling might have sufficient meta-semantic clout to easily settle the matter.

‘There’s *no fact of the matter*’
 ‘It’s *sort of* a biscuit, *but sort of not*’
 ‘It’s *partly* a biscuit, *but partly not*’
 It’s *kind of* a biscuit’
 ‘It’s *slightly* biscuity’
 ‘It’s biscuit-*ish*’
 ‘It’s biscuit-*y*’
 ‘It’s not *not* a biscuit’
 ‘It’s a biscuit, but not a *biscuit* biscuit’
 ‘It’s a biscuit, but not a *proper* biscuit’¹¹

Many of these may or may not be expressed with a complement clause – there are ‘that’ and ‘whether’ complements available – and the indeterminacy may also be reified (e.g. ‘It’s *an* indeterminate biscuit’). Moreover, we may sometimes express such forms merely by implicating them by our tone, response time, or speech-complementing gestures (like air-quotes, or by flailing ones arms around). Interestingly, not all forms are particularly natural sounding in every context, and it would be an interesting project in empirical linguistics to study the (in)felicitousness of their tokenings. The philosophical task, though, is to interpret the content of such locutions. I don’t suppose that we need to *fully* interpret *each and every* use of such locutions. We are, after all, concerned with a technical philosophical notion – and we’ve no *prima facie* reason to expect natural language locutions to perfectly track that notion, for their function may be more diverse. Nevertheless, it does seem that *some* tokenings of the above natural locutions seek to express something like the technical notion we’re here trying to define.

¹¹ Hat-tip: Yorkshire.

Agential symptoms: The use of the locutions just described is one manifestation of several features of agents that also seem symptomatic of indeterminacy:

Hedging: Questions with indeterminate answers, when posed, seem to elicit ‘hedging behaviours’ in response. ‘Hedging behaviours’ are expressions of hesitation: the use of one of the locutions above; pausing in response; responding in an unconfident tone; accompanying an assertion with non-verbal cues of unconfidence (e.g. shrugging); refusing to answer at all (refusing to assert ‘p’ or ‘¬p’ or to answer ‘yes’ or ‘no’); or by questioning the legitimacy of the question. Moreover, the hedging characteristic of indeterminacy seems somehow characteristically *blameless*. That is, agents are ‘blameless’ in the sense that they couldn’t have done anything to improve their assertoric situation. (They may well not be *faultless*, for they may be in violation of some assertoric norm, but they’re seemingly not to blame for any such fault.¹²)

*Ignorance:*¹³ Epistemic subjects often seem somehow ignorant in the face of indeterminacy: they seem incapable of – or seem to believe themselves incapable of – (at least first-order) knowledge about indeterminate matters. That is to say, they seem incapable of knowing the truth of statements lacking indeterminacy-expressing locutions. Moreover, the ignorance symptomatic of indeterminacy is again somehow characteristically *blameless* in the sense that they couldn’t have done anything to improve their epistemic situation. (Again, they may well not be *faultless*, for they may be in violation of

¹² There’s a tendency in the literature to claim *faultlessness*. That seems like an unnecessarily strong claim to me, and improperly considered to comprise the data.

¹³ Cf. Sainsbury (1986), Williamson (1994).

some epistemic norm, but they're seemingly not to blame for any such fault.)

Agnosticism: Doxastic subjects often seem to be agnostic in the face of indeterminacy – that is, they often lack beliefs about (at least first-order) indeterminate matters, or at least lack confidence in any such beliefs. Moreover, the ignorance symptomatic of indeterminacy is again somehow characteristically *blameless* in the sense that they couldn't have done anything to improve their doxastic situation – there is an evidential symmetry, but there is no way they could gather further evidence to break the deadlock. (Again, they may well not be *faultless*, for they may be in violation of some doxastic norm, but they're seemingly not to blame for any such fault.)

The pattern amongst these symptoms is that: (a) indeterminacy seemingly yields some less-than-ideal situation in some normed attitude or action (including speech-acts) of agents¹⁴, in the sense that one seems to lack sufficient warrant for taking a stand^{15,16}, and (b) the agent is somehow blameless (though not necessarily faultless). Though the three above have gathered most attention in the literature, there is little reason to expect that these symptoms (*non-ideality + blamenessness*) don't manifest elsewhere – for example, in suppositions, or desires, or preferences.

¹⁴ I do *not* assume that this 'less-than-ideal situation' is *indeterminacy*: viz, that confronted with indeterminacy, one has indeterminate beliefs. This may be correct, but it should not, I believe, constitute data. (Cf. Barnett (2009), who not only seems to consider such to constitute data, but also considers a *particular conception* of indeterminacy in such cases to constitute data.)

¹⁵ I do *not* suppose that there is evidential symmetry. It may be that one has more evidence for one alternative over the other. Regardless, it nevertheless seems to be the case that the evidence seems insufficient to secure warrant.

¹⁶ To be clear, the data here concerns how to judge particular cases, *not* the location of a boundary. This is to accommodate first-order indeterminacy. It may well be, however, that *vagueness* yields the additional feature that one is in some normatively non-ideal situation with regard to the *location* of a boundary, both in the weak sense that it does not seem that there is a boundary, and possibly the stronger sense that it seems there is no boundary.

Normative symptoms: Related to each of the above are various normative symptoms. I've purposely stayed neutral above on what the normative implications of indeterminacy *really* are, but it is nevertheless plausible that there *seem* to be normative consequences to indeterminacy. In some cases it seems as though it's permissible to assert or believe either way (on at least first-order statements). In other cases it seems impermissible to go either way (on at least first-order statements). And in other cases it seems as though we're lacking in normative guidance altogether. I suspect that normative governance about what to do in the presence of indeterminacy may well vary depending upon the *character* of indeterminacy at issue (the notion of 'character' will be explained later on), and may also be subject to various contextual factors. Regardless, it certainly *seems* as though each of these peculiar normative situations governs us in some cases of indeterminacy. Interestingly, and in contrast, this *never* seems (to me) to be the case with knowledge: regardless of whether we *can* have knowledge in cases of indeterminacy, it always *seems* like we cannot.¹⁷

Inter-agential symptoms: A corollary to the agential symptoms is the phenomenon of *behavioural/attitudinal divergence*: in the face of the same evidence about some case of indeterminacy, (a) agents¹⁸ seem to hold different attitudes from one another, or to take different actions from one another, (b) nobody is more to blame than anyone else for this divergence.¹⁹ Given the thesis of blamelessness, we could also call this phenomenon *blameless disagreement*. This should be distinguished from

¹⁷ Related to this is Williams's (2012) observation that indeterminacy seems to be enquiry-ending, in that we don't pursue further investigations into a matter once we discover that it is indeterminate. If, after all, it already seems to us that we're incapable of knowledge about whether *p*, further enquiry into whether *p* would seem pointless.

¹⁸ Or, indeed, one and the same agent at distinct times.

¹⁹ I say 'nobody is more to blame than anyone else' rather than 'nobody is to blame' in this case, because the community may well be capable of establishing conventions to secure against such divergence.

the *stronger* thesis of *faultless disagreement*. Several authors have subscribed to the stronger thesis of faultless disagreement in the *assertoric* case – what is sometimes called the ‘open-texture thesis’.²⁰ That is the thesis that divergence in assertoric behavior amongst competent speakers in cases of *vagueness* are *legitimate* – that nobody is at fault in asserting as they do. As I don’t take any claims about norms to enter into the data about *indeterminacy per se* (or, for that matter, about vagueness) I’ll point merely to the weaker thesis of blameless disagreement here.

Theorists often cite a further feature of indeterminacy that I’ve here neglected: the idea that indeterminacy yields *borderline cases*. I’m suspicious about the utility of this notion in characterising the data for two reasons. First, it is far from obvious that it’s always appropriate to say that *there is* a borderline case of such and such, rather than that *it is borderline whether* there is a case of such and such. As we’ll see below, there are theories of indeterminacy on which such scope distinctions really matter. This provides evidence, moreover, not only for the idea that ‘borderline case’ is merely synonymous with ‘indeterminate case’, but also that it smuggles in a particular conception of indeterminacy that would rule out certain theories from the start. Of course, it may well still be symptomatic of *some* species of indeterminacy, and so one might think that – to that extent – it may still be useful. However, even granting that, my second reason for scepticism is that I very much doubt that there’s a useful and informative pre-theoretical notion of ‘borderline case’ that adds anything beyond the symptoms listed above. That is, even if there is a pre-theoretical notion, I expect that its content is just that of a case that yields the above symptoms – and is thus synonymous with ‘indeterminate case’. As such, I think that adding it to the data would be redundant – we should just list those symptoms.

²⁰ See, for example, Wright (1987).

1.1.1.2 Examples

We don't need to just defer to symptoms however – there are many plausible *examples* of indeterminacy on offer. Here's a sample:²¹

- Incomplete or inconsistently defined terms:

Take Sainsbury's (2001) example: '**Child***' =_{df} **(a)** $x < 16$ years old \Rightarrow 'x is a child*' is true; **(b)** $x > 18$ years old \Rightarrow 'x is a child*' is false.

Or, consider this variant: '**Child!**' =_{df} **(a)** $x \leq 17$ years old \Rightarrow 'x is a child*' is true; **(b)** $x \geq 17$ years old \Rightarrow 'x is a child*' is false. Intuitively, it seems as though it's indeterminate whether a 17 year old is a 'Child*' or a 'Child!'.

- Incomplete or inconsistent fictions:

Did the seventh Doctor destroy Skaro? And is he half-human or fully Gallifreyan? And what's up with his age? All of these get seemingly inconsistent answers. And what's the answer to 'the question': Doctor *who*? This is underdetermined.²² In all of these cases, it seems as though the answer is indeterminate.

- Vague (soritical) terms:

Vague terms like 'bald' and 'tall' seem to be such that some cases – cases roughly in the middle of a sorites series – seem

²¹ The first two examples are plausibly instances of generic phenomenon afflicting any kind of success conditions – the particular conditions here being *truth* and *truth-in-a-fiction*. For instance, some meta-ontological theories suggest that languages about the non-fundamental have 'correctness conditions', which fall short of truth. These 'correctness-conditions', too, may be subject to incompleteness or inconsistency. Moreover, paired with an inflationary conception of the non-fundamental, this could be a route to metaphysical indeterminacy.

²² Though - in significant contrast to many examples of incomplete fictions - the fiction does tell us that there is an answer, which is an interesting illustration of a true-in-the-fiction-existential without a true-in-the-fiction instance.

to be such that it's indeterminate whether the term applies to them.

- The truth-values of sentences with presupposition failures:
 What's the status of the sentence "The King of France is bald" (at least since 1792, when the National Convention decided to perform a diachronic sorites)? Those of us with Fregean/Strawsonian inclinations tend to see it as indeterminate – and I'm sure that even Russellians would admit to the intuitiveness of such a *pre-theoretical* judgement.
- Quinean/Fieldian 'indeterminacy' of meaning:
 The first two examples above are plausible cases of what we might call *an indeterminate meaning*. Field's (1973) example of pre-Newtonian 'Mass', and Quine's (1960) introduction of the 'inscrutability of reference' and 'holophrastic indeterminacy', seem like plausible instances of indeterminacy *of meaning*. An Arrente-speaking subject's utterance of 'gavagai' is, Quine suggests, 'indeterminate' in reference *between* 'rabbit' or 'undetached rabbit part' or 'severe case of myxamatosis' (it is Australia).
- Entities subject to the 'problem of the many':
 Some terms seem subject to Unger's (1980) 'problem of the many': it seems as if, by some pretty plausible conditions about what it takes to be him, we're threatened with the awful possibility that there might be *many* Jeremy Clarksons. But, if we're confident that there really is just one, then it seems indeterminate which of several candidate sacks of flesh really is him.
- Entities subject to 'ship of theseus'-style paradoxes:
 'Ship of Theseus'-style paradoxes present us with examples of entities subject to gradual change over time, such that it's

unclear whether the thing you started out with is the thing you end up with. This provides *prima facie* cases of ‘indeterminate’ diachronic identity: indeterminacy in whether a thing persists over time.

- Statements about the future:

What’s the status of ‘Labour will win the Police and Crime Commissioner election tomorrow?’ when uttered about tomorrow’s election? If you can muster the will to care, it’s likely that – even if you’ve read the YouGov poll and have good grounds for a prediction – you’ll think it’s indeterminate: it just hasn’t happened yet.

- Mathematical undecidables:

The Continuum Hypothesis suggests that there is no set whose cardinality is strictly between that of the integers and the real numbers. Goldbach’s conjecture suggests that every even integer greater than 2 can be expressed as the sum of two primes. These are but two examples of mathematical statements that might be judged indeterminate. Moreover, as Benacerraf (1965) has pointed out with his ‘identification problem’, there are multiple possible set-theoretic reductions of arithmetic. Take two examples: the von Neumann interpretation takes the successor of x to be $x \cup \{x\}$, whilst the Zermelo interpretation takes the successor of x to be $\{x\}$. Both seem equally good candidates, but they cannot both be right. It’s tempting to conclude that it’s indeterminate which is the reductive base.²³

²³ Benacerraf, of course, is partly motivated by such considerations to adopt structuralism. The case thus points to the interesting possibility that indeterminacy might be a useful alternative or explication of other varieties of structuralism.

- Scientific examples:

Quantum mechanics tells us that a quantum system is such that an observable can fail to have a definite value (an eigenvalue) when the system is in a state of superposition.

It's tempting to interpret the 'indefiniteness' pertaining to the observable in a state of superposition as indeterminacy.

Moreover, the theory also tells us that there is a phenomenon of entanglement, whereby the state of a composite system cannot be 'factorised' into definite states for its components.

In such cases, it seems like the system, but not its constituent particles, are in a definite state. As Lowe (1994) and French & Krause (1995) have pointed out, it's tempting to view this as indeterminacy.

Moreover, examples aren't confined to physics. Consider a case from evolutionary biology: there are a variety of species concepts on offer, but each of them seem to admit of indeterminacy in one way or another. Whether understood in terms of 'reproductive isolation', or 'similarity', or 'occupation of an ecological niche', to take just three examples, each seems to yield the consequence that it will be indeterminate of some organisms whether they are conspecifics. Moreover, the possibility of 'ring-species' offers a putative case of *vagueness*.²⁴

²⁴ In respect of scientific examples, Colyvan (2001) has used them to give a Quine-Putnam indispensability argument for metaphysical vagueness: that, taken at face-value, our best scientific theories seem committed to it. Of course, the naturalist and epistemological holist underpinnings of such arguments have their detractors. Moreover, plausibly, in order for us to distil such metaphysical conclusions we need to be sure that the relevant statements are not merely true, but also couched in sparse terms. Insofar as the relevant examples concern natural kinds, though, that doesn't seem implausible.

This is no doubt inexhaustive for all seeming examples of indeterminacy – perhaps the liar sentence should be listed amongst these too, for instance. Regardless, what unifies all of these examples is that they seem to exemplify phenomenon that exhibit symptoms like those listed above. It's possible to deny that such cases really *are* indeterminate.²⁵ But, recall, we're here trying to characterize the *intuitive phenomenon*, not to give a substantive *theory* of it: it's certainly an option for a *theory* to go error-theoretic about some of these putative cases.²⁶

I think two general observations about putative examples are worth making. First, I take it that, unlike many theories of indeterminacy, the data about indeterminacy is *loci neutral*: intuitively, sentences, knowledge, belief, assertions, properties, objects, identities, and composition (amongst other things) all seem subject to indeterminacy – or, more carefully, the pre-theoretical notions of them are. Of course, it may well turn out that the technical theoretical notions that a philosophical theory offers in an analysis of such notions may well *not* be indeterminate. Second, the data is also *domain neutral*: intuitively, indeterminacy infects everyday claims, mathematics, law, and the sciences. Again, it may well turn out that such putative indeterminacy will be explained away on final analysis.

Whilst domain and loci neutrality do constrain *overall* theory choice, in that such putative indeterminacy must be at least explained away, that needn't obviously be the burden of a theory of indeterminacy *per se*. That is to say,

²⁵ See Barnett (2008) on incomplete definitions, for instance.

²⁶ There are actually two error-theoretic strategies one could take towards these. First, we could offer a substantive theory *of one or other of them* in such a way that they're not, as a matter of fact, indeterminate. Such a move would impose nothing on the theory *of indeterminacy*. Another error-theoretic strategy, however, would be to argue that it is not even conceptually coherent that one or other such phenomenon be construed as indeterminacy. That, of course, would be imposing in requiring a substantive theory of indeterminacy which – combined with conceptual claims about the phenomenon in question – might be used to establish such incoherence. Either way, however, presents no challenge to the *pre-theoretical* idea that such phenomenon exemplify indeterminacy.

we shouldn't dismiss an account just because it fails to mop up all of these examples – though, plausibly, it should make sense of *enough* of them (however many that may be). But at the same time, we should be able to make sense of *candidate* accounts of the nature of indeterminacy (an aspect of a theory which I'll clarify shortly) that *are* accommodating to each such loci or domain – domain and loci neutrality shouldn't be violated at that stage in theorising. The underlying point here is methodological: it's always an option to give up some of the data as accurate, but you must be mindful about *where* in your theorising it is ruled out. Dismissing data may well be acceptable in the course of defending some token theory, insofar as the costs are ameliorated by other relative virtues of such a theory. But the meta-theoretical task of the next chapter is a different story: no attempt to scope out the theoretical options would be adequate if it was parochial in either of these respects.²⁷

Before moving on, we should note one notable omission from this list: any anti-realist theses, such as moral non-cognitivism. 'Anti-realism' is a motely term, but many 'non-factualist' anti-realists gloss their views as the belief that there is 'no fact of the matter' about some issue, and they often seem to ascribe symptoms to those phenomenon similar to those outlined above. While some such claims *may* be unpacked as attributions of indeterminacy, we should be cautious here.²⁸

First, indeterminate statements seem truth-apt, whilst many anti-realists claim otherwise about their target discourse. (In this sense, thus, we might be well served by distinguishing two senses of 'failures of bivalence', one

²⁷ The underlying methodological conviction, here, is that the constraints imposed on theorizing about some putative phenomenon by the pre-theoretical gloss on that phenomenon needn't directly constrain token theories of it, but instead on the meta-theoretical space of theories relative to which any token theory is evaluated (in cost-benefit analysis).

²⁸ One plausible case is discussed by Barnes (2014): the 'ontological anti-realism' of Chalmers (2009) and Yablo (2009).

which applies to only truth-apt statements which fail to have a truth-value, and one which applies to any sentence which fails to have a truth-value. The former, it seems to me, is what we normally care about – nobody takes interrogatives, say, to be a challenge to bivalence. The point is, we should be cautious about arguing, for example, from the claim that indeterminacy is marked by failures of bivalence, and that moral non-cognitivism yields failures of bivalence, to the conclusion that moral non-cognitivism countenances indeterminacy. That argument equivocates over our two senses of ‘failures of bivalence’.)

Second, as the literature on deflationism points out, *non-factual* statements nevertheless seem ‘truth-apt’ with respect to a *disquotational* truth-predicate: I can say ‘that’s true’ when you say ‘seb is funny’, even if non-factualism about comedy is true. But it doesn’t seem okay to say ‘that’s true’ when you say ‘bob is bald’, about borderline bob.

Third, it seems like many cases of ‘non-factualism’ would be better diagnosed as cases of what Darby (2010) has called ‘inapplicability’. Very roughly, the thought here is that, in the case of indeterminacy, it seems like there *could* (conceptually) be a ‘fact of the matter’, but that the world has somehow fallen short on this occasion.²⁹ In some cases of non-factualism, however, it doesn’t seem like there’s anything appropriately ‘fact-shaped’ for there to even *possibly* be a fact of the matter. Metrical anti-realism seems true, not because it seems indeterminate whether the world is fundamentally metric or imperial, but rather because there’s no metric-fact-shaped hole to be filled. There’s ‘no fact of the matter’ not because a metrical fact fails to obtain, but rather because there’s nothing eligible to be

²⁹ This modal should, perhaps, be best understood as a claim of conceptual possibility, rather than metaphysical possibility, to accommodate the possibility of cases of necessary indeterminacy. The point, then, is that while it might be conceptually possible for there to be a fact of the matter in cases of indeterminacy, it *doesn’t* seem conceptually possible for some varieties of anti-realism that there could be a fact of the matter.

considered to obtain or otherwise. Likewise, the ‘no fact of the matter’ countenanced by the moral non-cognitivist isn’t due to some moral facts failing to obtain – rather, it is anathema to the concept of morality (says the non-cognitivist) that there *might* be any such thing as a ‘moral fact’ or ‘moral truth’ – facthood and truth are *inapplicable* to moral discourse.

As such, we should pause before making any sweeping claims about the indeterminacy-relevance of any anti-realist doctrines: they should really be looked at on a case-by-case basis. Moreover, it would be theoretically prudent to enquire also into the nature of ‘inapplicability’, insofar as such may be a rival diagnosis of putative cases of indeterminacy. Nevertheless, I’ll set such investigations aside here.³⁰

1.1.2 Neutral characterization

Non-ostensive theory-neutral characterisations are difficult to provide. Consider the not uncommon rough gloss that something is indeterminate just in case it is ‘neither true nor false’. First off, this violates loci neutrality: it constrains us right away to thinking of only *truth-bearers* as subject to indeterminacy. Nor is there a straightforward way of generalizing it by something like the following: for any loci, and any putatively ‘binary’ states in which a loci may be, indeterminacy is what happens when it is in *neither* state. This ‘neither’ gloss effectively promotes a ‘gappy’ conception of indeterminacy, which is but one of several ‘flavours’ of indeterminacy that

³⁰ We’ve some *prima facie* reason to expect that ‘inapplicability’, however unpacked, won’t be too much of a rival. This is both because of the plausible differences outlined in the main text, and because inapplicability seems often wielded at entire discourses (in contrast to the more localized outbreaks in putative examples of indeterminacy), and relatedly, to be a necessary characteristic of the infected domain (unlike many cases of indeterminacy). That is, non-factualism about morality seems to impugn *all* of moral discourse, and necessarily so. By contrast, only some statements about the future seem indeterminate, and many to be only contingently so. If inapplicability has, as it were, a discourse-wide blast-zone, and a non-contingent character, then it seems *prima facie* unsuitable as a diagnosis of putative cases of indeterminacy.

we'll meet later on. As such, it won't do either. Nevertheless, there are a few things we can say.

1.1.2.1 General features

We can point to three additional features that seem like truths about the phenomenon of indeterminacy. These seem so trivial as to be barely worth mentioning, but they do importantly constrain the plausible theories – even if (as some theories might) they're ultimately explained away:

Categoricity: As the above locutions indicate, indeterminacy seems like a categorical phenomenon, in such a way that (a) using one of the above locutions seem like an appropriate response to a categorical question³¹; (b) It seems that 'it's indeterminate whether *p*' can be true of some particular time, place, and world without depending upon any other time, place and world than that of which the indeterminacy is attributed (cf. contingency or temporariness).

Betweenness: Indeterminacy is always indeterminacy *between* two or more distinct states, as reflected in '*indeterminate whether*' being contrastive. That being said, it is legitimate to express indeterminacy non-disjunctively by mentioning only one such state. For example:

(1) 'It's indeterminate whether this is red'

However, there is always a corresponding exhaustively disjunctive description that expands the contracted form - 'exhaustive' in the sense that it mentions every alternative *between which* there is indeterminacy.³² There are minimal and maximal expansions. A

³¹ Cf. Williams (2012) on indeterminacy's 'question relevance'.

³² I do *not* assume that they must be *exclusive* – consider, for instance, 'it's indeterminate whether Bob is bald or tall' – nor even when the alternatives are negated or co-determinates of a common determinable: that would rule out some gluttony conceptions of indeterminacy from the start.

minimal expansion either adds a disjunct that negates the contracted form, for example:

(2) 'It's indeterminate whether this is red *or not red*'

Alternatively, it might state alternatives that are *not* the negations of one another. For example:

(3) 'It's indeterminate whether this is red *or orange*'

Nor, unlike this case, do I suppose that the alternatives need to be co-determinates. That is, the following seems legitimate:

(4) 'It's indeterminate whether this is red *or spherical*'

Any such form may be impoverished in that, while they represent all of the alternatives, they under-describe the alternatives.³³ So, for instance, assuming that (3) holds, (2) and (3) would be better described by the following maximal expansion:

(5) 'It's indeterminate whether (this is red and not orange) *or (orange and not red)*'.

Compromised boundaries: The phenomenon that it 'infects' – the thing that is *subject* to indeterminacy (i.e. the indeterminacy bearer) – is somehow 'structurally compromised'. Most familiarly, when a *term* is subject to indeterminacy, it seems as though its 'boundaries' – i.e. its extension and anti-extension – are somehow compromised, in the sense that they don't neatly partition in the way we might

³³I don't mean to suggest that the question of how the exhaustive set of alternatives are to be carved up is a straightforward matter. Alternatives correspond to what I denote as 'states' in the model in the next chapter, and it is the theoretical role of such states, I think, from which we will gain instruction on such matters. If the indeterminacy infects, say, the belief-state of an agent, then instruction on carving up the alternatives must ultimately be sensitive to their suitability *qua* cognitive states of that agent. This isn't, moreover, a trivial matter - it could have normative import: for example, an agent may well be excused of having determinate beliefs when faced with a case of indeterminacy insofar as they lack the requisite conceptual wherewithal to demarcate the alternatives in question (even if they may be criticized for being so conceptually impoverished). Similarly, this sort of issue might concern indeterminate decision-making, where the issue of how to carve up alternatives in a decision-matrix is well known to impact upon the prescriptions of some decision rules.

classically expect them to. The nature of this compromise is, as we'll see, controversial. Nevertheless, it at least seems as though, in order for anything to *be* infected by indeterminacy, it must have something construable as a 'boundary' that can be seen to be structurally compromised.

1.1.2.2 Logical features

Additionally, we can offer some minimal logical rules that seem to properly capture the behavior of indeterminacy. (Given the wealth of logical options, many of which have advocates in the literature, there is no hope of giving a *comprehensive* logic of indeterminacy that will serve a theory-neutral characterization.) To do so, focus attention on object-language operators for expressing indeterminacy.³⁴ The introduction of such operators into a language seem necessary on pain of our language being expressively impoverished: it won't do to restrict our attention to mere meta-linguistic characterisations of indeterminacy, both because indeterminacy-theoretic operators seem easily introducible, and because indeterminacy-theoretic locutions are, as we've seen, a feature of natural language anyway. Moreover, looking to them is theoretically useful: by stating minimal principles governing these operators, we constrain what counts as an acceptable theory of indeterminacy by constraining what counts as an acceptable consequence relation.

³⁴ These are not the only ways in which we might introduce indeterminacy-theoretic locutions into our object language. We might, for example, prefer an indeterminacy predicate (of first or higher orders), a special class of indeterminacy terms, special indeterminacy-expressing propositional connectives (e.g. a non-truth-functional disjunction as well as a truth-functional disjunction), or an object-language (in)determinacy-indexed copula. Which of these is best is unobvious, as is their relative expressiveness. It may well be that any one of these is more metaphysically perspicuous a device for representing (metaphysical) indeterminacy than an operator – if, say, metaphysical indeterminacy is fundamentally a matter of there being indeterminate properties then maybe a 2nd order predicate would be best; or if it fundamentally infects instantiation, perhaps an object-language copula would be best. Nevertheless, given their considerable unfamiliarity, I will simplify discussion here by sticking with the orthodox operator approach.

There are, of course, two kinds of operator of interest: those that represent indeterminacy ‘ ∇ ’, and those that represent determinacy ‘ Δ ’³⁵. It seems to be a constraint on *any* acceptable ‘ ∇ ’ operator that it be such that both of the following hold:

$$(1) \quad \vdash \nabla(p) \equiv \nabla(\neg p)$$

$$(2) \quad \vdash \nabla(p) \supset \neg \Delta(p)$$

Importantly, there are two species of operator for each, depending upon the appropriate form of the complement: whether we are talking about it being (in)determinate *whether* something is the case, or it being (in)determinate *that* something is the case. Thus, there are four operators which merit attention:

$\nabla_w(p)$: It is indeterminate whether p

$\Delta_w(p)$: It is determinate whether p

$\nabla_t(p)$: It is indeterminate that p

$\Delta_t(p)$: It is determinate that p

Actually, I’m not entirely convinced that there *is* a pre-theoretical notion of ‘indeterminate *that*’, nor even that sense can be made of it.³⁶ But, since it has been discussed in the literature, and since I might just be lacking in imagination, I’ll discuss it here nevertheless.

³⁵ I’ll use the delta/nabla notation throughout. The literature often deploys alternatives, such as ‘!’ or ‘ \mathcal{D} ’. They’re sometimes dubbed the ‘aoristic operators’.

³⁶ This is because, to me anyway, when the *whether* clause takes a single proposition, it always sounds elliptical for a disjunction (i.e. ‘*whether p*’ sounds to me to be elliptical for, or to pragmatically implicate, ‘*whether p or $\neg p$* ’). Not so with the *that* clause. But, as I said above, if *Betweenness* is a characteristic feature of indeterminacy, then an indeterminacy operator should be contrastive. That the *that* form fails to be so, so say I, is why it is unsuitable.

The whether- and that- variants are importantly different. The first difference concerns factivity:

$$(3) \quad \Delta_T(p) \vdash p$$

$$(4) \quad \Delta_W(p) \not\vdash p$$

Factivity fails for ' Δ_W ' because, intuitively, there are two ways in which it might be determinate *whether* something is the case: ' $\Delta_T(p)$ ' or ' $\Delta_T(\neg p)$ '. But, by the factivity of ' Δ_T ', if it is the latter, then ' $\neg p$ '. Moreover – just in case the dialetheist in you doesn't think this is enough to establish (4) – the following also seems analytic: $\Delta_T(p), \neg p \vdash \perp$. Thus, if it is the case that ' $\Delta_T(\neg p)$ ', then it fails to be the case that ' p '. Thus, factivity for ' Δ_W ' fails.

Relatedly, the following differences also seem to hold:

$$(5) \quad \Delta_T(p) \vdash \neg \Delta_T(\neg p)$$

$$(6) \quad \Delta_W(p) \vdash \Delta_W(\neg p)$$

By (1) and (2), both pairs are duals within their species:

$$(7) \quad \nabla(p) \vdash \neg \Delta(p) \ \& \ \neg \Delta(\neg p).$$

They also seem to be governed by the following inter-species relations:

$$(8) \quad \vdash \nabla_T(p) \equiv \nabla_W(p)$$

And thus:

$$(9) \quad \nabla_W(p) \vdash \neg \Delta_T(p) \ \& \ \neg \Delta_T(\neg p)$$

$$(10) \quad \nabla_T(p) \vdash \neg \Delta_W(p) \ \& \ \neg \Delta_W(\neg p)$$

1.1.3 Puzzles & Paradoxes

There are three central puzzles that seem to have some relevance to indeterminacy: the sorites paradox, the problem of the many, and the ship of theseus puzzle. Each involves *prima facie* instances of indeterminacy. These problems provide particular motivation for theorizing about indeterminacy due to their paradoxicality and their generality.

Whether it is a duty of a theory of indeterminacy *per se* to resolve these puzzles - rather than, say, a theory of *vagueness* - is moot, but it seems plausible that theorizing about the apparent indeterminacy in each case can at least *help* in that task, even if it only better enables us to be clear on the division of explanatory labour between theories of indeterminacy and theories of vagueness. As with all of the features hereby listed, it's deniable - though rarely denied - that indeterminacy and vagueness are connected, and that vagueness is an entirely distinct phenomenon in its own right. Even if that's not the case, however, their relationship is not clear. There seem to be four options: (a) Perhaps vagueness is a *kind* of indeterminacy (i.e. identical with a subspecies of indeterminacy); or (b) perhaps it is indeterminacy *plus* some other feature (i.e. only *partly* constituted by indeterminacy); or (c) perhaps it's not to be (even partially) identified with indeterminacy at all, but rather vagueness holds *in virtue of* indeterminacy; or (d) again, they're not to be (even partially) identified, but rather *some* indeterminacy holds *in virtue of* vagueness.

As such, the puzzles provide two distinct reasons for theorizing about indeterminacy: first, that they exemplify plausible instances of indeterminacy; and second, because such may offer insight into their resolution.

1.1.3.1 The Sorites Paradox

The Sorites Paradox is the central puzzle motivating discussions of vague terms like ‘bald’ and ‘tall’. The paradox involves a series of cases with the following two features: (i) neighbours differ minutely in respects relevant to the application of some vague term, such that it seems there should be no difference between neighbours in whether the term applies to them; (ii) the term clearly applies to the first case and clearly doesn’t apply to the last case. Given that set up, *prima facie* plausible lines of reasoning seem to lead us to contradiction. There are many ways of formulating the paradox, the most common of which is the following:

(1)	Fa_1	Clear case
(2)	$\neg Fa_{100}$	
(3)	$\forall x(Fx_n \rightarrow Fx_{n+1})$	Tolerance premise
\therefore	Fa_{100}	\perp

The premises and the rules of inference used both seem compelling, in spite of the ensuing contradiction – hence the paradox.

It is not uncommon to think that indeterminacy has something to do with soriticality - not least because, as I said above, vague terms seem to give rise to similar symptoms to indeterminacy. Moreover, that seems to be the case because it is also very plausible that any plausible theory of indeterminacy should deliver the following:³⁷

³⁷ Moreover, one might think that iterated- Δ forms of these principles are intuitively compelling (e.g. that a clear case ‘Fa’ is such that ‘ $\Delta^n Fa$ ’ for arbitrary n). The coherence of holding *both* of these two principles so generalized has been called into question. Regardless, they certainly *seem* compelling, and a theory should account for that impression – even if it must, *per* incoherence, explain it away.

(Δ Clear-Cases) $\exists n(\Delta Fa_n) \ \& \ \exists m(\Delta \neg Fa_m)$ - Vague terms have some (possible³⁸) determinate instances – some cases to which they determinately apply.

($\neg\Delta$ Cut-off-1) $\neg\exists n(\Delta Fa_n \ \& \ \Delta \neg Fa_{n+1})$ – There’s no point in a sorites series for F where F determinately applies to some case and determinately doesn’t apply to its neighbour.

($\neg\Delta$ Cut-off-2) $\neg\Delta\exists n(Fa_n \ \& \ \neg Fa_{n+1})$ – There’s no determinate point in a sorites series for F where F applies to some case and doesn’t apply to its neighbour.³⁹

(∇ -cases) $\exists n(\neg\Delta Fa_n \ \& \ \neg\Delta \neg Fa_n)$ – There’s some cases (plausibly in the middle of the series) such that they’re neither determinately F nor determinately $\neg F$.

Delivering each of these seems like a plausible requirement of any theory of indeterminacy. As I said above, however, whether a theory delivering such ought thereby also *resolve* the paradox is an open question.

1.1.3.2 The Problem of the Many

The problem of the many is a *prima facie* metaphysical problem that is structurally very similar to the sorites, as we’ll discuss later on. Its distinctive feature is that it is, foremost, a *cardinality* problem: it threatens intuitive claims about how many entities of some kind there are in some given scenario. Discussion normally centres around ordinary sortal terms like ‘cloud’ or ‘mountain’. The paradox involves a collection of cases with the following three features: (i) all cases differ minutely in respects relevant to the application of the sortal, such that it seems there should be

³⁸ The modal caveat is required in order to accommodate the plausible thought that there may *actually* be only borderline cases of a vague term.

³⁹ The underlying thought being that small differences make no difference as to whether it *seems* that the predicate is satisfied. (This isn’t paradox inducing, given the non-factivity of ‘seems’). This idea of *seeming* tolerance is, I think, conceptually prior to other (e.g. alethic, epistemic) notions of tolerance.

no difference between any case in respects of whether the term applies to them; (ii) the sortal is clearly satisfied; (iii) the sortal is clearly satisfied by no more than one entity. Given that set up, *prima facie* plausible lines of reasoning seem to lead us to contradiction. There are many ways of formulating the paradox, one of which is the following:

Let 'F' be a sortal predicate. Let D be a domain such that (i) it contains a paradigm F; (ii) it contains only entities differing minutely in respects relevant to the application of 'F'. Let 'x' and 'y' be variables over D.

(1) $\exists xFx \ \& \ (\forall yFy \rightarrow x = y)$	Cardinality
(2) $\forall y(\exists xFx \rightarrow Fy)$	Equality
(3) $\exists x\exists y, x \neq y$	Multiple-candidature
$\therefore \exists xFx \ \& \ \exists yFy \ \& \ x \neq y$	\perp

It is not uncommon to think that indeterminacy has something to do with the problem of the many, insofar as it seems as though a plausible response to the problem is to say that it is determinate *that* there is an F, but either that it is indeterminate *which* thing is F, or that the F is itself indeterminate.

1.1.3.3 The Ship of Theseus Paradox

The Ship of Theseus Paradox is another *prima facie* metaphysical problem. Its distinctive feature is that it seems to yield indeterminate diachronic identities. Discussion normally centres around intuitively persisting entities, like ships, which can undergo change, and the kind of change usually discussed involves replacement of parts.

In its weaker Plutarchian form, we begin with a ship that progressively undergoes change in small increments, such that its parts are replaced one by one. Intuitively, no single such change seems sufficient to disrupt the diachronic identity, although the later ship has *no* parts identical with the

original entity. Did the ship survive? In one respect, it seems not: the latter ship shares no parts in common with the original. On the other hand, it seems as though things can survive small progressive changes in their parts.

In its stronger Hobbesian form, a further supposition is introduced: we're now to consider that the parts removed from the original ship are reassembled into 'another' ship. So, which is the original ship – the reassembled ship or the repaired ship? The Hobbesian form exploits the seeming conflict between two plausible intuitions: that (a) ships can survive changes in their parts; and (b) an object can survive disassembly and reassembly. As such, it seems difficult to say one way or the other.

It is not uncommon to think that indeterminacy has something to do with the Ship of Theseus paradox, insofar as it seems as though a plausible responses to the problem may include saying that it is indeterminate *whether* the ship survives, indeterminate *how much* change a ship can survive, or that it's indeterminate *which* of the two later ships is the original ship.

1.1.4 Explanatory duties

The features outlined above thereby impose explanatory duties on a theory of indeterminacy. Any such account must, thereby, offer a (plausibly partial) interpretation of natural language indeterminacy-theoretic locutions; be capable of handling at least some of the examples; explain the agential, inter-agential, and normative symptoms; comport with the general structural and logical characteristics; and have meaningful application to the indeterminacy puzzles (even if it doesn't succeed in resolving them). I've purposefully stated throughout that many of these features *seem* to hold. One straightforward way to achieve the explanatory burden is thus for a theory to claim that they are *true*. However, it may be reasonable for a

theory to go error-theoretic on any of these features just in case it explains why those features *seemed* plausible.

So, for example, epistemicist theories of indeterminacy may say – to take a sample - that natural language locutions are sometimes interpretable as expressions of uncertainty; that hedging is due to assertion being knowledge-normed; that the logical principles governing ‘ Δ ’ and ‘ ∇ ’ are justified by the logic of (un)knowability (e.g. that the factivity of ‘ Δ_T ’ is due to the factivity of ‘Knowable $_T$ ’); and that the tolerance premise of the sorites is false, but seems true because there’s no knowable counter-instance. And so on.

In general, the symptoms will – plausibly - not be explained by an account of indeterminacy *per se*, but rather in combination with some plausible norms governing the implicated attitudes and performances – that is, any account of indeterminacy must, paired with such norms, predict those symptoms. The examples (including those exhibited in the paradoxes and puzzles) may not all be accommodated by token theories, but as I stated above, the upshot of their diversity is the imposition of the domain and loci neutrality constraints on the meta-theoretical model endorsed in the next chapter. The general requirements, moreover, impose certain structural requirements, and so again constrain the space of acceptable token theories.⁴⁰

Any theory capable of playing the explanatory-role so outlined deserves to be deemed a candidate theory of indeterminacy. Those candidate substantive theories will be judged, accordingly, (a) by how well they fulfill

⁴⁰ In the next chapter, *Categoricity*, *Betweenness*, and *Compromised boundaries* are imposed as formal parameters in the model offered as, respectively, the *A*, *S*, and *I* components. Domain and loci neutrality are delivered by the liberality of interpreting the *L* component, and thus of the entire model.

this explanatory duty⁴¹; (b) by how well they comport with substantive philosophical theories of implicated phenomena (e.g. knowledge, meaning, belief etc.).

1.2 The Explanandum (part 2): *Metaphysical Indeterminacy*

Having fixed upon the explanandum of a theory of indeterminacy, what's the explanandum for a theory of *metaphysical* indeterminacy in particular? This question is particularly pressing in the face of skeptical worries about whether there is *any* coherent notion of 'metaphysical' indeterminacy, and thus whether there is any explanandum available for theorising about in the first place.⁴²

1.2.1 Desiderata

Before exploring the options, and because the possibility of characterizing metaphysical indeterminacy is contested, we should pause to be clear on what the desiderata are for a pre-theoretical characterization. Here are some plausible proposals for what one might request:

- *Neutrality*: The characterisation is neutral between substantive theories of the phenomenon.⁴³
- *Discrimination*: The characterisation delivers plausible judgements on which things count as instances of the phenomenon, and doesn't decide on contested cases.

⁴¹ Relative to the other candidates, and as measured by cost-benefit analysis in terms of ones chosen list of theoretical-virtues.

⁴² See, for instance, Dummett (1975), Lewis (1993), Horgan (1994), and Sainsbury (1994).

⁴³ The neutrality constraint rules out several glosses – though many of these are, perhaps, intended to be pitched as substantive theories rather than characterisations of the explanandum – such as the claims that metaphysical indeterminacy is 'worldly underdetermination'.

- *Intelligibility*: The characterisation is composed of meaningful semantic units and is syntactically well formed.⁴⁴
- *Coherence*: The characterisation is not analytically unsatisfiable.
- *Dialectical adequacy*: The characterisation could, perhaps given adequate translation, be seen to be intelligible and coherent in the sceptics own language.⁴⁵

The last three are ordered in terms of increasing strength. Characterising some phenomenon as ‘that φ such that it is either a yellow bentine or a quackcandle’ is unintelligible, because it is composed of meaningless components. By contrast, ‘that φ such that φ is a square and a circle’ is intelligible, yet seemingly incoherent - not just in the weak sense that it is metaphysically impossible, but in the stronger sense that it seems analytically unsatisfiable. A characterization could, perhaps, achieve intelligibility and coherence but nevertheless fail to be dialectically adequate insofar as it is untranslatable into the language of a skeptic. Untranslatability may be taken to be evidence that the characterization is *not* intelligible or coherent after all, but it should be clear that untranslatability could equally evidence that the skeptic’s language is expressively impoverished.⁴⁶ Perhaps, for instance, a characterization of

⁴⁴ This is plausibly a constrained notion of ‘intelligibility’ – there may well be stronger uses of that term incorporating any of the further candidate desiderata. In particular, this is a weak notion of intelligibility insofar as it is *not* required that it be intelligible *to any particular individual* – in particular, that it be intelligible to the skeptic. This seems correct: a characterization should not be deemed unintelligible because, say, there is some individual who lacks sufficient mastery of the language in which the characterization is couched. It being intelligible in ones own language may serve, epistemically, as a good grounds for judgement of intelligibility, and offer security against those who feign competence with unintelligible expressions. But, the grounds of good *judgements* of intelligibility could well fail to coincide with the grounds of intelligibility itself.

⁴⁵ I’m assuming, as seems reasonable, that any *adequate* translation will preserve intelligibility and coherence.

⁴⁶ I set aside here Quinean worries, as well as the suggestion that some terms or expressions may be in principle untranslatable. I assume that skeptics about metaphysical indeterminacy aren’t resting their skepticism upon such strong

quantum entanglement could not be translated into Aramaic. That's no indictment of that characterization, or any reason to doubt the phenomenon of quantum entanglement, but rather a failure of Aramaic.^{47,48}

1.2.2 Candidate characterisations

There are a ton of proposals in the literature for how to gloss the idea of metaphysical indeterminacy. Candidate characterisations come in four forms: formalist, negative, deferential, and functional. We want a characterisation that is robust enough to meet our desiderata.

1.2.2.1 Formalist characterisations

Formalist characterisations seek to isolate distinctively *metaphysical* indeterminacy as having some definitive effect upon the formalism within which our account of indeterminacy is couched – either logically, semantically, or syntactically.

Logical characterisations:

One of the most prominent attempts at characterising metaphysical indeterminacy is via some revisionary claim about some aspect of classical logic. Let's focus here on the most common such idea: that metaphysical

claims, not least because it's not clear why they would discriminate against a characterization of just metaphysical indeterminacy in particular.

⁴⁷ Of course, we shouldn't thereby dismiss a *substantive* theory as unintelligible or incoherent just because it can't be translated into the skeptics language.

Nevertheless, it still seems desirable that a *pre-theoretical characterization* be dialectically adequate, insofar as we're concerned with addressing the skeptic anyway. (If all one cares about is a pre-theoretical characterization sufficient for framing disputes about substantive theories, it may not matter that it be translatable into the *skeptics* language, but it should plausibly be translatable into the languages of theorists offering competing substantive theories).

⁴⁸ I don't suppose that the characterisation needs to *succeed* in isolating some (actual, and perhaps even possible) phenomenon. There's plausibly successful characterizations of 'Phlogiston' and 'Santa Claus' available, even if they fail to denote.

indeterminacy is marked by failures of the law of excluded middle. Such characterisations seem to suffer three difficulties. The first difficulty concerns neutrality: it is not clear that failures of LEM are *necessary* for the obtaining of metaphysical indeterminacy – we’ll see theories later that *maintain* classical logic. Glossing it in this way would thus rule those theories out from the start.

The second difficulty concerns discrimination: it’s not clear that failures of LEM are *sufficient* for metaphysical indeterminacy. Suppose, for example, that the function of negation is to serve as an object-language device for marking anti-extensions such that, for example, ‘ $\neg Fa$ ’ effectively tells us that the object denoted by ‘a’ is in the anti-extension of the property denoted by ‘F’. Moreover, suppose we can stipulatively introduce incomplete terms (like ‘Child*’ above) that have non-exhaustive extensions and anti-extensions. In that case, it seems as though we could get failures of LEM seemingly in absence of metaphysical indeterminacy. Maybe neither of those presuppositions is sustainable but, nevertheless, a pre-theoretical characterization shouldn’t be hostage to that.

The third problem regards dialectical adequacy. It may be protested that LEM’s validity is *guaranteed* by the meaning of disjunction and negation – such that denying LEM is incoherent. Moreover, to stipulatively introduce connectives on which something LEM-like *fails* to be valid, the objection continues, one must thereby fail to express disjunction or negation *proper*. If one insists that one really *is* talking about disjunction and negation, then ones claims are unintelligible. Regardless of the force of this objection to substantive theories which *do* deny LEM - that is, regardless of whether we *can* defend its intelligibility and coherence –no such claim can thus be dialectically adequate, because any skeptic who takes LEM to be analytic

will be incapable of translating any supposed instances of failures of LEM into their own language.^{49,50}

Semantic characterisations:

A second formalist attempt is to appeal to the non-classicality of a *semantic theory*: in particular, to the possibility of a non-classical (intended) *interpretation* of natural language. The most explicit advocate of this view is Smith (2008). Smith claims that those semantics that assign, say, gappy/glutty/degreed extensions to vague terms, are effectively interpreting our predicates by appeal to gappy/glutty/degreed *properties*. As such, he thinks, any semantic theory which deems such interpretations to be *intended*, is thereby committing to indeterminate properties and, thus, to metaphysical indeterminacy.⁵¹ As such, it might be proposed that we characterise metaphysical indeterminacy as that phenomenon which must be described in a language with a non-classical intended interpretation.

Smith seems to think that such a position drops out of his ‘semantic realism’, that is, a realist view of semantic relations relating semantic and non-semantic entities, a view which he contrasts with Davidsonian instrumentalism. However, it should strike us as curious: it seems to make metaphysical indeterminacy far too cheap. Suppose, for instance, that we

⁴⁹ This assumes that dialectical adequacy requires that there be an object-language equivalent of the characterization in the skeptic’s language. It may be thought that that is too strong: perhaps it’s enough for dialectical adequacy that the skeptic’s language can give a meta-linguistic characterization of their opponents object-language claims of the form ‘x speaks a language L such that...’. That doesn’t seem enough to me: I can well express the statement in my language that “‘=’ in Larry’s language means *being married*”, but that offers me no reassurance that what the marriage-as-identity theorist is expressing is intelligible and coherent.

⁵⁰ To be clear, the point here is *not* that one cannot give a *substantive* theory of metaphysical indeterminacy in this way, but rather that one cannot give a pre-theoretical characterisation of it as such if one wants to respect dialectical adequacy for the purposes of appeasing the skeptic.

⁵¹ Smith’s primary concern is with vagueness, and thus he discusses what he calls ‘worldly vagueness’. I nevertheless assume that the discussion carries over unproblematically to the more general thesis of metaphysical indeterminacy.

stipulatively introduce an incomplete predicate, like ‘Child*’ above. In that case, if Smith is correct, semantic realism would straightforwardly deliver us a ‘gappy’ property: CHILD*. There are two complaints one might make about this.

First, we might follow Williams (2012) in pointing out that, although we might admit that the entities so countenanced can play the role of semantic-values, “...their playing this role could be a reflection of our language use...” The thought in this case, then, is that the cases so described don’t qualify as instances of metaphysical indeterminacy because they’re derived from my *stipulating truth-conditions* – a paradigmatically (meta-)semantic phenomenon. One difficulty with this reply is that it seems to assume a distinct conception of metaphysical indeterminacy that Smith himself seems to be relying on. Smith isn’t claiming anything about *how* the entities he so describes have their genesis, just that – whatever their origin – they’re metaphysically indeterminate. As such, the most charitable reading of his position, it seems to me, is one whereby the phenomenon of metaphysical indeterminacy may sometimes obtain in virtue of use-facts. As such, he may be seen as offering a characterisation distinct from the common idea that metaphysical indeterminacy is ‘indeterminacy with a metaphysical source’.⁵² So, why think there is such ‘metaphysical indeterminacy’? Well, says Smith, because semantic realism tells us so: it says that we’re committed to those very (indeterminate) entities that our correct semantic theory describes (even if its correctness is determined by meta-semantic phenomena just like our stipulation). Sure those things owe their existence to facts about use, but nevertheless they are – by the thesis of semantic realism – *bona fide* metaphysical entities, and gappy/glutty/fuzzy entities at that. But, *table-thump*, isn’t it *obvious* that

⁵² But, what other conceptions *are* there? We’ll discuss this more in the next section. In the terms of the next section, the account of the nature of metaphysical indeterminacy Smith is working with appears to be ‘non-sourced’.

Smith's conception is too cheap! As Williams says, "surely the existence of a function from colour patches to the reals isn't enough by itself to demonstrate worldly vagueness". Well, maybe, but I'm not so sure. It's a guiding thought of many theorists about vagueness that it involves *fuzziness*. Now, if we're realists about sets – i.e. we think they're *bona fide* metaphysical entities – and our semantic theory tells us that we need to countenance *fuzzy* sets, then why not think we've thereby discovered some cases of metaphysical indeterminacy?⁵³ Regardless of this issue of 'cheapness', this dispute between Smith and Williams reveals two competing conceptions of metaphysical indeterminacy. Witnessing that, it cannot be the case that Smith's offering is sufficiently neutral to serve as a pre-theoretical characterization.

Second, there's another line of complaint in Williams: that there's no guarantee that the properties to which semantic realism commits us are *sparse* – i.e. there's no guarantee that the, let us suppose, set-theoretic entities to which we're committed to *qua* semantic values correspond to *natural or fundamental* properties. This seems right. Moreover, as Williams says, it also seems that there *would* be metaphysical indeterminacy if the *sparse* properties were, say, fuzzy. Once our attention is focused upon this, it seems as though it's indeterminacy of *sparse* properties that we really care about when enquiring after *metaphysical* indeterminacy.^{54,55} As such, the semantic characterisation fails to be

⁵³ Compare the position of Tye (1990): that since 'bald' has an indeterminate extension, it corresponds to an indeterminate set. That's unpersuasive by itself – we may alternatively consider 'bald' to be indeterminate in extension between multiple precise sets. Smith secures the conclusion, by contrast, by means of the dual assumptions of semantic realism and the intendedness of a non-classical interpretation.

⁵⁴ By itself, this doesn't show that Smith hasn't succeeded in establishing an *instance* of metaphysical indeterminacy. I'm thinking here of the claim that *semantic values* are metaphysically indeterminate entities themselves (regardless of whether they correspond to sparse properties): after all, isn't the thesis of semantic realism the idea that semantic properties are *themselves* sparse? I won't explore whether there *is* a good argument here for *some* cases of metaphysical

suitably discriminating – its rampant diagnoses of metaphysical indeterminacy seem, intuitively, like false-positives.

In both these respects then – its violation of neutrality and discrimination – accounts appealing to non-classical semantics fail to yield adequate pre-theoretical characterisations.^{56,57}

Syntactic characterisations:

A final formalist approach seeks to characterise metaphysical indeterminacy syntactically by focusing on the scope of (in)determinacy operators. The idea is that metaphysical indeterminacy is that phenomenon expressible by our quantifying into the scope of an indeterminacy operator. As an example of this sort of view, consider Tye's (2000) gloss:

indeterminacy. It suffices to point out that there's nothing to be offered here in the way of a general characterisation of metaphysical indeterminacy. Even if it turns out that the *only* cases of metaphysical indeterminacy are metaphysically indeterminate semantic-values, bundling that claim into a pre-theoretical characterisation would clearly violate neutrality by way of a controversial claim about the extent of metaphysical indeterminacy.

⁵⁵ Of course, given a suitably anti-realist attitude to ontology, one might well think that metaphysical indeterminacy *is* so cheaply obtained, because our ontology is, somehow or other, constituted by us and our language. This seems to be the position of Zemach (1991). I'm assuming a broadly realist attitude throughout.

⁵⁶ A further problem for some instances of the semantic approach concern those that deny bivalence. They face an incoherence objection: Williamson's (1994) argument that denials of bivalence are absurd. Again, regardless of whether non-bivalence can be defended in the face of this challenge, it again seems to render such characterisations dialectically inadequate, for the same reasons that the denial of LEM did.

⁵⁷ Similar considerations attend to Hyde's (1998) argument for metaphysical vagueness from the ineliminability of vagueness from natural language, and its lack of vague descriptions on any precise description. Even conceding those claims, such observations are insufficient for establishing metaphysical indeterminacy unless we have reason to think that the expressions of a vague language are metaphysically perspicuous. We can perfectly well concede that any language lacking the predicate 'bald' will be expressively impoverished, but that gives us no reason to assume that the predicate denotes a sparse (and vague) property of baldness.

$$\exists S(\lambda y \exists z [\nabla (y \text{ is a part of } z)])x.$$

Some proponents of metaphysical indeterminacy deny that we can abstract into an indeterminate context. Nevertheless, the spirit of Tye's suggestion here could be retained by allowing the indeterminacy operator to take wide-scope over the lambda operator – or, indeed, by expressing it without property abstraction at all by instead availing ourselves of second-order quantification:

$$\exists X \exists x (\nabla X x)$$

Likewise, consider the view of Williamson (2003) – where '∃S' is quantification into sentence position, with the domain ranging over states of affairs:

$$\exists S (\nabla S)$$

The first problem with such accounts echoes the discrimination complaint against Smith: there's no guarantee that what's being quantified over in these cases are appropriately *sparse* to deliver what seems like *bona fide* metaphysical indeterminacy. Something like this complaint is, I think, what Sainsbury (1995) is expressing when he says that "every property of representations induces a property of nonlinguistic things: for every linguistic property, an ontic one. Corresponding to the linguistic property of being vague, there is the ontic property of being a satisfier of a vague linguistic thing". The point here, I take it, is that if we're allowing ourselves to quantify over abundant properties - including those like *being a satisfier of a vague linguistic thing* – then it seems as though this sort of account won't sift out the intuitively semantic indeterminacy from the metaphysical.⁵⁸ The same point applies to the Williamsonian formulation

⁵⁸ Thus, I think, Tye (2000) misses the point when he responds that the truth of the *de re* claim isn't guaranteed by semantic vagueness. Sure, it may not be. But

insofar as there's a distinction to be drawn between sparse and abundant states of affairs (a distinction we might view as inherited from the sparsity/abundance of the properties that those states of affairs comprise).⁵⁹

Second, the account as it stands also fails to be discriminating insofar as it delivers no guarantee that '∇' be given an appropriately *metaphysical* interpretation. As such, it needs to be stipulated – as Tye does – that '∇' is to denote, for instance, *non-epistemic* indeterminacy. As such, however, it appears that the *syntactic* element is doing no work whatsoever: we're effectively just giving a negative characterization of the kind to be discussed below.

Third, some theories of metaphysical indeterminacy do *not* countenance *de re* metaphysical indeterminacy, but only *de dicto* metaphysical indeterminacy. As such, syntactic proposals offer neither sufficient nor necessary conditions for metaphysical indeterminacy, and so again fail to be discriminating. Any attempt to undermine this claim by alleging such substantive theories to be incoherent effectively violates neutrality.

Fundamentalist variants:

It's tempting to try to respond to some of the above shortcomings by restricting the criteria to fundamental languages (those which 'carve at the joints', featuring only predicates for sparse properties, only names for fundamental objects etc). As such, we might try to refine Smith's proposal by suggesting that it's only non-classical semantic theories of *fundamental* languages that we might take to truly indicate metaphysical indeterminacy.

the problem is that its truth doesn't guarantee that it is *not* semantic vagueness, and thus fails to offer a suitably discriminating characterization.

⁵⁹ As such, Williamson's claim that fuzzy semantics commit to metaphysical indeterminacy seems guilty of exactly the same oversight as Smith, albeit at the level of states of affairs.

That's more appealing, but nevertheless it fails to accommodate views of metaphysical indeterminacy that do *not* require giving a non-classical semantics. As such, even this refinement fails to be sufficiently neutral to serve as a pre-theoretical characterisation.

We might also try to patch the syntactic approach this way, by claiming that syntactic characterisations succeed only when paired with a fundamental language. However, I assume that in doing so - by thereby deeming that '∇' is an operator suitable for inclusion in a fundamental language - we're effectively guaranteeing that '∇' is properly *metaphysical*. But, it seems as though the *syntactic* conception is thereby redundant. Even so, is there anything to this approach? We saw that we couldn't gloss MI as our fundamental language having a non-classical interpretation, but perhaps we might instead gloss it as our fundamental language containing a '∇' operator. The problem with this is that it won't serve to be dialectically adequate unless we give some account of what '∇' is. Any skeptic who interprets '∇' semantically or epistemically is just going to flat out refuse to accept that it has any proper place in a metaphysically-perspicuous fundamental language.

1.2.2.2 Negative characterisations

A persistent problem with the formalist characterisations was their inability to be suitably discriminating. It is precisely in response to such worries that several 'negative' characterisations have been proposed. Here's a sample (my emphasis):

“There are objects having *non-epistemically* fuzzy boundaries.”, Tye (2000)

“When I say that indeterminacy of some utterance is ontic I will mean that the indeterminacy is *not a consequence of semantic indecision* in the component terms of the utterance.” Hawley (2001)

“[A token] Sentence S is ontically vague iff: *were all representational content precisified*, there is an admissible precisification of S such that according to that precisification the sentence would still be *non-epistemically* indeterminate in a way that is Sorites-susceptible.”, Barnes (2010) ⁶⁰

There are three kinds of problem with such accounts. The first are residual discrimination worries. Tye’s proposal is transparently too narrow insofar as it ties metaphysical indeterminacy solely to indeterminacy of *boundaries*.⁶¹ While Hawley’s fails to rule out epistemic indeterminacy, it can clearly be patched up to avoid that. The real difficulty with it concerns, as Barnes points out, its inability to handle ‘mixed cases’ – those in which the indeterminacy is partly metaphysical and partly semantic. As such, its problem is that it may undershoot. Barnes’s proposal also, however, suffers a deficiency in respects of discrimination. Consider the following possibilities: (a) that some metaphysical indeterminacy *is also* semantic

⁶⁰ Barnes (2010), p606-7 seems to suggest that anything stronger than a negative definition would require giving a *reductive* characterization, so ruling out substantive theories that claim that metaphysical indeterminacy is *primitive*, so violating neutrality. That’s mistaken: the following characterisations also leave the door open to non-reductive accounts. Moreover, leaving room for a primitive *metaphysical* analysis of metaphysical indeterminacy doesn’t obviously require we give a primitive *conceptual* analysis of the concept METAPHYSICAL INDETERMINACY – it may well be that there’s room to say informative and substantive things about the concept even if we think that the nature of the phenomenon it describes is primitive. The reason for this is that a concept of even some metaphysically primitive phenomenon may encode more information than about just the *nature* of the phenomenon so described – it may give (albeit schematic) answers to many of our questions listed at the outset, as well as claims such as those in the preceding section (e.g. about its symptoms, logic, examples etc.).

⁶¹ Stipulating at the outset that they *are* the only cases of metaphysical indeterminacy plainly violates neutrality.

indeterminacy; (b) that metaphysical indeterminacy might *supervene* on semantic indecision. Pre-theoretically, it seems to me, we have no good reason to rule these out. However, in either case, in the counterfactual situation in which the semantic indeterminacy is eradicated, so is the metaphysical indeterminacy. As such, the right-to-left of Barnes's biconditional appears to overshoot too. Again, insisting that the biconditional *doesn't* overshoot effectively rules out substantive theories which commit to either (a) or (b), and so violates neutrality.

The second kind of problem concerns incoherence. As Eklund (2011) and Lopez de Sa (2014) have emphasised, consider the following negative definition: "A man is a *married bachelor* iff he is a bachelor but *not* unmarried". This appears plainly incoherent: it seems that 'some bachelor is not unmarried' is analytically false, and thus that 'married bachelor' is analytically unsatisfiable. What's the relevance of this for us? Well, it concerns the skeptic who insists that it is analytic that indeterminacy is semantic, and thus that 'metaphysical indeterminacy' is incoherent. Negative accounts offer nothing to establish the coherence of 'metaphysical indeterminacy'.

The third difficulty with both Hawley's and Barnes's proposals are the peculiar feature that they treat utterances and sentences, respectively, as the bearers of metaphysical indeterminacy. That's odd: isn't metaphysical indeterminacy meant to be a feature of 'the world', not of representational entities? Regardless of whether representational entities *can* be bearers of metaphysical indeterminacy, the complaint here is that in tying us to a particular account of what the bearers are, these characterisations are thereby non-neutral.

1.2.2.3 Deferential characterisations

An improvement on some of those failings is provided by the gloss given by Barnes & Williams (2010):

“it is metaphysically indeterminate whether p iff (1) it is indefinite whether p , and (2) the source of this indefiniteness is the non-representational world.”

It neither ties us to a particular conception of the bearer of metaphysical indeterminacy, nor does it seem to rule out possibilities like (a) and (b). Its key means of seeking to improve upon the negative claim is to defer to a *generic* notion of ‘indefiniteness’ in (1).

Still, however, this is problematic. Barnes and Williams tell us that it is “deployed in ordinary speech”, but that seems to be *exactly* what the skeptic denies: according to them, the ‘ordinary’ notion is such that it is analytic that it is *semantic*. Even if we abandon the claim that there is an *ordinary* notion which is suitably generic, it also seems question-begging to just *assume* that a generic notion could even be introduced – according to the skeptic, it seems, the semantic notion is as generic a notion as there is. Both Eklund (2011) and Lopez de Sa (2014) emphasise this point by considering definitions of ‘metaphysical context-sensitivity’ and ‘unmarried bachelors’ by appealing to generic notions of context-sensitivity or bachelorhood.⁶²

⁶² Russell’s (1923) allegation that the proponent of metaphysical vagueness commits a ‘fallacy of verbalism’ also looms large here. According to Russell, vagueness *just is* a feature of representations – a case of representational mismatch – language being one special such case. Russell’s claim seems to me to be an instance of a complaint now more familiar in discussion in philosophy of science over modeling: that, effectively, the supposition of metaphysical vagueness treats an artifact of a semantic model as a representor – in the manner of mistaking the density of cardboard used in an architectural model to be a feature of the building so modeled. The important point, for us, is that a deferential characterization is dialectically inadequate in the face of such an accusation: Russell’s allegation is precisely that there *is* no more generic notion. Barnes

Those examples make clear that we cannot assume any generalised notion is to be had.⁶³ As such, deferential characterisations fail to be dialectically adequate.

1.2.2.4 Functional characterisations

The poverty of deferential characterisations lay in the *assumption* that there is a generic notion to be had. Barnes & Williams (2011) also, however, mention a potential improvement: that “we should characterise generic indeterminacy via its conceptual or functional role...”. The idea, then, is that we explicitly *spell out* a generic notion. But, we can do exactly that by appealing to the considerations outlined in section 1.1, defining the concept as being such that all of those claims – its symptoms, structural and logical features, and plausible instances - are constitutively analytic claims about it.

Though the concept, so introduced, is stipulatively defined, I nevertheless believe that the constitutive claims above are *platitudes* in at least one sense: they seem *prima facie* true. I don’t, however, take them to be so if ‘platitudes’ are construed as *transparent* truths about a *folk* concept ‘indeterminacy’. Some of the claims above concern technical philosophical

(2010) has sought to accommodate Russell by retaining his conception of vagueness, but by claiming that *metaphysical* vagueness is that special case where it is sourced metaphysically. But what counts here? Isn’t the mismatch pertaining to ‘bald’ partly sourced in there being no unique crisp property capable of being its denotation – and isn’t that a ‘metaphysical source’? Isn’t the mismatch between ‘phlogiston’ and the world partly sourced in the metaphysical fact of there being no such phenomenon? It seems like Barnes needs to say that the phenomenon she’s trying to describe are those cases of representational mismatch sourced *in metaphysical vagueness*. But in that case, we’re appealing to a notion of vagueness (of the metaphysical sort), that’s not of the representational kind, and so *not* ceding to Russell’s conception.

⁶³ Of course, notions such as ‘metaphysical ambiguity’ may *well* be coherent (Colyvan (2001) gives electrons as an possible example) – but the proponent of metaphysical indeterminacy should be able to admit that there are *some* notions such that generalised forms are unavailable. Again, the point is not that there *is* no generalised form, but that it’s dialectically inadequate to assume that there is.

issues, so I doubt very much whether that's the case. Asking after the folk concept (or concepts) in the vicinity of our technical concept is an interesting question. For all I know, the technical concept may well be identical with the folk concept - perhaps if concepts are individuated by dispositions to judge, say, rather than by sets of transparent platitudes. But we needn't concern ourselves with the (partly empirical) question of what the folk concept(s) of indeterminacy is, for there's no reason to assume that such is the 'proper' explanandum. We can take as an explanandum whatever we like, and the motivation for focusing on *this* one is nothing other than the conviction that it is philosophically interesting. Nevertheless, they're not completely independent: the hope is that the technical concept has *some* relation to the folk concept(s), in that substantive theories about the former should yield prescriptions about the proper employment of (or revisions of) the latter, in the event that the folk bump up against the relevant philosophical issues.

With such a concept, then, we can ask *non-trivially* whether the attendant phenomenon is 'semantic', or 'metaphysical', and so on (I'll turn to what such questions may amount to shortly). Moreover, we have an appropriately *unified* concept that is coarse-grained enough to permit that a possibly metaphysically disunified phenomenon falls under it, and so this helps us avoid the charge that multiplying kinds of indeterminacy would multiply our concepts.⁶⁴

⁶⁴ The relevant concern here is Eklund's (2011) 'non-uniformity' argument against metaphysical indeterminacy – in short, that we end up with multiple concepts of indeterminacy where it seems that we have just one. That complaint might take the stronger form of demanding that indeterminacy have a uniform *nature*. But, that's no challenge to the *intelligibility* of metaphysical indeterminacy. Moreover, as an argument from parsimony, it's plausibly premature insofar as it's far from obvious that non-metaphysical species indeterminacy can exhaust the role of indeterminacy – and it is far from obvious pre-theoretically that, say, quantum indeterminacy or the open future *can* adequately be handled by the semantic indeterminacy that Eklund favors.

Eklund (2011) & Lopez de Sa (2014) are sceptical about this. They express doubt about whether even *epistemicist* ‘indeterminacy’ is really indeterminacy *proper*, rather than just a means of explaining away of indeterminacy. As Eklund puts it, “...one may well think that what the epistemicist view really involves is that what we mistake for genuine indeterminacy is merely a certain kind of ignorance.” Such scepticism seems misplaced. It seems that Eklund and de Sa must be (question-beggingly) fleshing out our earlier specification of the explanandum of indeterminacy with some beefier semanticist notions. If they are *insistent* on bundling semanticist notions into the term ‘indeterminacy’, then we should instead just introduce the generic notion by means of a technical term, ‘indeterminacy*’, that removes that baggage. They may well now complain: but that’s not *proper* indeterminacy. But, the complaint has now shifted from incredulity about the phenomenon to a superficial complaint about the *application of their term* to that phenomenon. But why should we care about whether the phenomenon we’ve outlined can satisfy *their* preferred use of the term ‘indeterminacy’? This far up the dialectical tree, all we can do is settle upon an explanandum and seek to theorise about it. It doesn’t much matter if we call that explanandum ‘indeterminacy’ or ‘indeterminacy*’ - call it what you like. We see the same thing in debates about vagueness – about which cases are *proper* cases of ‘vagueness’. This is a non-concern: we’re not using these terms in their ordinary sense, but as technical terms, and as such it’s up to us which phenomena we want to stick them on: it’s up to us which phenomena we consider the explananda to be. Insofar as they disagree with our *choice* of explananda, they’ll need a better reason than that it doesn’t correspond to what *they* call ‘indeterminacy’. We’ve established dialectical adequacy insofar as we’ve outlined a concept that they can judge intelligible and incoherent – and noting that the term ‘indeterminacy’ in *their* language doesn’t apply to it doesn’t establish that our concept is either unintelligible or incoherent for them.

Barnes and Williams say that “We’d have this generic concept unless it turned out that it’s analytic of indeterminacy that all indeterminacy is semantic indecision.” This leads Lopez de Sa to rightly complain ‘*so what, you owe us a reason to think that it isn’t analytic*’, at least insofar as we’re concerned with persuading the skeptic who *does* think that it is. This seems correct, and it’s tempting to say at this point– just as with a *Cartesian* sceptic – that we should be fine with our inability to persuade the sceptic, as long as we’ve discharged any supposition that we had an *obligation* to persuade them. However, Barnes & Williams are wrong to concede the point about analyticity in the first place. It may well turn out that *some* concept of indeterminacy – maybe even the folk notion, let alone that used by the skeptic – is such that it is analytic that it is semantic. But that is irrelevant to our carving out an intelligible explanandum, and to our ability to *stipulatively* refer to it with the *technical* term ‘indeterminacy’. Again, if there’s any discontent here, it concerns the *application of a term*, not the explanandum itself. If the sceptic is irked by our introducing ‘indeterminacy’ as a technical term as such, then fine – we can call it something else. What we call it is irrelevant. Any residual concern that we’re not focusing on indeterminacy *proper*, if that’s of any substance, can only amount to the thought that there’s a *better* explanandum in the vicinity: semantic indeterminacy. But, the important point is that complaining that we haven’t isolated a *good* explanandum is quite a different complaint from the allegation that our explanandum is unintelligible or incoherent.⁶⁵

⁶⁵ A different species of ‘incredulity’ objection may target particular theories of indeterminacy – in particular, the way any such theory may interact with other theoretical notions. For instance, one may reject non-bivalent accounts as ‘incomprehensible’ on the grounds that it doesn’t square with one’s account of meaning or truth. That line of objection is improperly expressed as *incredulity*, rather than incompatibility: having a substantive account of, say, truth or meaning shouldn’t rob you of a sufficiently pre-theoretical notion of ‘meaning’ or ‘truth’ on which you *can* understand specific proposals – such notions being graspable via a rough conception of the theoretical roles we expect (pre-theoretically) those

Moreover, quite how we could arbitrate disagreements about what makes a 'good' explanandum seems, to me, unclear – I expect they're intractable. Choices of explanandum seem like the sorts of foundational decision of the kind which fix a research program, and whose worth can only be judged post-hoc via the fruits (or otherwise) of theorising endeavoured on that basis.

The considerations outlined in section 1.1 thus don't merely identify the explanatory role of indeterminacy. They also demarcate a generic *concept* of indeterminacy.⁶⁶ Skeptics may well deploy a beefier concept, however such proposals should be understood to be *revisionary* in that they supplement the fairly minimal concept here outlined. It is, I suggest, this minimal concept of indeterminacy – and the phenomenon it purports to pick out – that exhaustively captures an interesting pre-theoretical concept, and thus an interesting pre-theoretical conception of the phenomenon of indeterminacy. Any substantive theory of indeterminacy, including the hypothesis that there is metaphysical indeterminacy, earns its status *as* such a theory, and as non-deserving of incredulity, insofar as it is capable of doing the explanatory job of accounting for what is responsible for the explanandum captured by that minimal concept.

notions to play. As such, anyone pushing incredulity this way should just try harder, and dust off their pre-theoretical concepts.

⁶⁶ One objection to the concept so defined arises from my sometimes using 'indeterminate' in so characterizing the notion above? Isn't that objectionably circular, or otherwise evidence that I'm *relying* on a folk concept or maybe –even worse - the semanticists? This worry is misplaced. Where I do seem to use 'indeterminacy' problematically in the characterization it is in the direct ostensive characterization, where I say that the examples 'seem like instances of indeterminacy'. That should be taken to be shorthand for 'seem to display all the features outlined by the rest of the characterization'.

So armed with a generic concept, we can enquire into whether the attendant phenomenon is metaphysical, semantic, epistemic, and so on. What is *this* sort of question asking?

1.3 Three questions about indeterminacy

In this section, I want to discuss indeterminacy's nature, source, and manifestations. Why distinguish these? Well, it is not uncommon in the literature to find a classification of theories of vagueness as semantic, epistemic, metaphysical, contextual, or psychological theories, and it's natural to want to look to these for an account of indeterminacy. But the problem is that it is not always clear exactly what these classifications are classifications *of*, for they could naturally classify answers to any of our questions (i), (ii), and (iii) above. Let's pause for a little while to be clear on exactly what these questions are after, and sketch out the meta-philosophical background for the ensuing discussion.

I'll understand (i)-(iii) as follows (where ' ϕ ' should be understood as ranging over domains of inquiry, e.g. semantics, metaphysics, epistemology etc.):

- (i) When a theory says that indeterminacy has a ' ϕ -nature', I'll understand that as the claim that indeterminacy has a correct '*metaphysical analysis*' into an analysis that concerns some phenomenon P , such that P is the subject matter of ϕ -theorising.
- (ii) When a theory says that indeterminacy has a ' ϕ -source', I'll understand that as the claim that particular cases or instances of indeterminacy obtain or hold *in virtue of* ϕ phenomena.
- (iii) When indeterminacy *manifests* ϕ -ly, I'll understand that to mean that properties, relations, or objects that are the subject matter of ϕ -theorising are themselves subject to indeterminacy.

Before looking at how to address these questions, I'll clarify and illustrate them, and discuss their interrelation.

1.3.1 The 'nature' question

To begin, this construal of the 'nature' question merits discussion, for the idea of a 'metaphysical analysis' is itself not straightforward. It would take us too far afield here to discuss rival conceptions of metaphysical analysis at length⁶⁷, but I should be at least clear on what it is that I mean by it.

Call something an *analysis* only if it is a bi-conditional, or some suitable schema, such that it provides the means to translate one discourse into another, and is such that the analysandum and analysans necessarily co-vary in truth-value. (The analysandum in our case is defined by the characterisation of the explanandum above.) Say that a *metaphysical* analysis differs from a *conceptual* analysis in the following two ways. First, they are analyses of distinct things: conceptual analyses analyse concepts, while metaphysical analyses analyse the phenomena the concepts purport to pick out. Second, they impose different adequacy conditions on an analysis – in particular, metaphysical analyses needn't be conceptual truths, nor *a priori* (while at least the former holds trivially of conceptual analyses).⁶⁸ Moreover, the success of a metaphysical analysis – and what renders necessary co-variation in truth value *insufficient* for success – requires that it provide or entail a true type-identity claim: the type of

⁶⁷ See, for example, Rayo (2013), and Dorr (2005) for some recent discussion of the notion.

⁶⁸ Cf. Haslanger & Saul (2006) on 'conceptual' and 'descriptive' analysis. Haslanger also distinguishes what she calls 'ameliorative' analysis, but I think that describing this as a third kind of analysis can be a bit misleading. In ameliorative analyses, we're meant to have a motivating concern with what a concept is *for*. But, there are two ways this can manifest itself, both of which are relevant to *either* kind of analysandum: first, by effecting which token (concept, or phenomenon 'tracked' by a concept) is our analysandum (e.g. by determining the theoretical-role of the analysandum); second, by effecting what our analysis is normed to (e.g. truth, usefulness for justice etc.).

phenomena which the analysandum-discourse is about is identical to the type of phenomena that the analysans-discourse is about.⁶⁹ For example, trope theorists who metaphysically analyse property discourse into trope-theoretic discourse commit themselves to the view that the type of phenomena we call ‘properties’ is type-identical to the phenomena theorised about by trope-theory: properties *are* (identical to) tropes.

Call a metaphysical analysis *reductive* just in case it fulfils the further requirement that the analysans is ‘more fundamental than’ the analysandum.⁷⁰ I don’t suppose that a good analysis has to provide an absolutely fundamental analysans. That is, an analysis of indeterminacy

⁶⁹ What are the relata of a type-identity claim about indeterminacy? The relevant phenomena needn’t necessarily be things of which we’re most familiar with making identity claims about, like objects or properties. Maybe indeterminacy or modality, which are represented in our discourse by operators, *do* correspond to a kind of object or property. But, whatever category these phenomena belong to, that shouldn’t be settled by an account of metaphysical analysis *per se*, but rather by a specific theory of indeterminacy or modality. We could, perhaps, avert to talk of ‘facts’, and say that the type of *fact* of something being indeterminate is identical to another type of fact. That’s risky though – not only because it risks committing us to metaphysically controversial entities (facts), and hostage to a criterion of identity for facts, but also because – even if we do countenance them – it’s far from obvious that our theory of indeterminacy will permit us to talk of ‘*the fact* that something is indeterminate’ (to preview, the worry here is that, just as some views don’t permit us to talk about *the possible world* at which something is indeterminate, the theoretical role of facts might likewise inhibit us from being able to talk about indeterminate *facts*, rather than of indeterminacy between facts). All this being said, I don’t think we should worry too much about this, for there is clearly a pre-theoretical notion of phenomena-identity, and it is really the job of an account of identity – not an account of metaphysical analysis – to cater for that.

⁷⁰ There is an apparent oddity about the last claim. If the relative fundamentality claim is understood as asserting the obtaining of an *in virtue of* relation, and such relations are (as is commonly assumed) irreflexive, then how can the analysis establish *identities* between the phenomenon of which our two discourses pick out? This oddity is resolved once we acknowledge that the ‘relative fundamentality’ claim should be unpacked, instead, as the claim that the analysans discourse is a *more metaphysically perspicuous* way of talking about the self-same phenomenon which the analysandum talks about. This is no place for an account of ‘metaphysical perspicuity’, but we can understand it operationally as the degree to which a characterisation of some phenomenon can help us address questions (i)-(ix).

may avert to propositions or sentences or facts or whatever, but it isn't a duty of such an analysis of indeterminacy *per se* to provide analyses of *those* entities. As such, even if such entities aren't fundamentalia, a theory of indeterminacy may nevertheless offer good analyses in terms of them. Of course, it would be problematic for an *overall* theory if any such entity required a reductive analysis while no such reduction could be squared with its hypothesised indeterminacy-role. However, it's far from obvious that the blame should be laid for that on a theory of indeterminacy *per se* rather than, say, the theory of propositions. (Indeed, the proponent of any view of indeterminacy averting to such entities may well view that theory as a *constraint* on any analysis of those entities.) More importantly, achieving equilibrium between a theory of indeterminacy and our theory of, say, propositions, must be posterior to having a theory of indeterminacy at all – and that's our job here.

So, answering (i) will require establishing that the phenomenon of indeterminacy is type-identical with some ϕ -phenomenon.⁷¹ But, this is not to diminish the import of *token* identity claims for them, and an attendant criterion of individuation for instances of indeterminacy, also seem desirable – not least because we have some intuitive conception of how to individuate instances that we should like a theory to respect. It being indeterminate whether this leaf is red or orange and it being indeterminate whether this same leaf is red or not red are, intuitively, the same instance of indeterminacy. It is far from trivial getting these answers out however – for example, some theories seem to treat the indeterminacy of a *language* as explanatorily prior in some sense to indeterminacy in components of that language. Does this mean that there is really only one

⁷¹ This is quite different to the notion of 'analysis' employed in Barnes (2010), which is something like 'characterisable in some formalism'. As such, she thinks that, say, Williamsonian epistemicism and semantic supervaluationism have a uniform analysis because they can both be glossed in a supervaluationist formalism. That's not the sense of analysis here: those two theories type-identify indeterminacy with completely different phenomena.

instance of indeterminacy, then, on such accounts? Can we individuate instances by appeal to accounts of how to individuate indeterminacy-bearers? We'll return to this in due course – it's clear, at least, that we need to at least establish type-identities before we can start addressing such questions.

Before moving on, it's worth asking: Why construe the 'nature' question as a request for a mere *identity* claim? Why not construe it as a request for the (intensional or hyperintensional) *essence* of indeterminacy, or for a 'real definition', or something in that vein? The motivation for this sort of request, I guess, is the thought that 'there must be *more* to indeterminacy than what it is identical with!' I do not disagree with that thought. However, it's hard to see what more there might be *other* than what could be given in response to questions (i)-(ix). As such, construing the 'nature' question this way seems to be just another way of asking for an answer to each of (i)-(ix).⁷²

1.3.2 The 'source' question:

Source claims are, as I propose to understand them, claims to the effect that *instances* of indeterminacy obtain for such and such a reason. That is, source claims explain why indeterminacy – whatever it is – obtains *here*. As I've said, I'm understanding this (i) as consisting in an *in virtue of* claim, and

⁷² There is something a little peculiar about asking about the essence of indeterminacy – consider asking after the essence of possibility, or the essence of essence - but I don't think it is misguided (see Correia (2006) for a non-objectual conception of essence). Any peculiarity about it springs, I think, from the fact that metaphysical phenomena – phenomena at this level of abstractness – are normally assumed to have their features essentially, such that asking after their *essence* seems redundant once one has just asked after their features. However, the option of metaphysical contingentism (Miller (2009)) throws that assumption into question – in our case, it allows that the answers to (i)-(ix) might be contingent. As such, we might find that there are only some features of indeterminacy that can be appropriately conceived as its essential features, and thus that the 'nature' question construed this way *is* thereby asking something different from asking after the (merely) actually true answers to (i)-(ix). That being conceded, I'm happy to wilfully ignore the contingentist option in what follows.

(ii) as such that whether the classification of a source as a ‘ ϕ -source’ (e.g. metaphysical, semantic etc.) to be a matter of whether the phenomenon in virtue of which the instance indeterminacy holds is a subject of ϕ -theorising.

A few comments are worth making about this. First, the relevant phenomenon in virtue of which instances of indeterminacy hold are not, I’m supposing, necessarily rendered in fundamental terms. Second, given the second commitment, it’s not obvious that an instance of indeterminacy can’t be considered to be ϕ -sourced and ϕ' -sourced, just in case the relevant phenomenon in virtue of which it holds is the subject of distinct theoretical enterprises. (cf. saying that ϕ is a matter of the relevant phenomenon being classified as ϕ in *fundamental theory*). Third, source claims will, plausibly, be an partly empirical matter. The philosophical aspect of the question, however, effectively tells us where, empirically, to look.⁷³

1.3.3 The ‘manifestation’ question

It’s worth pointing out here both a weaker and a stronger sense of indeterminacy ‘manifesting’ – that of indeterminacy holding *of* some domain, and that of indeterminacy holding *in* some domain. For example, suppose that you think that indeterminacy *is* the phenomenon of its being *unknowable* whether some ‘p’ is true or false. There is no constraint, given the identification *per se*, on the sorts of things that could be unknowable – maybe some moral truths, or mathematical truths, or metaphysical truths, or semantic truths are unknowable. In that sense, the account can make sense of indeterminacy being exhibited in any of these domains: it can hold

⁷³ I will not assume any particular account of ‘in virtue of’, but it should accommodate the notion of being ‘partly ϕ -sourced’, and so we will require a notion capable of handling that, such as ‘partial grounding’. We also, of course, don’t need to assume that there is an all-purpose grounding relation that could play the myriad of dependency-like roles metaphysicians are interested in – we just need there to be a dependence relation capable of playing *this* role.

of any of them. Say that indeterminacy can *weakly*-manifest in these domains on this account. More carefully,

(Weak Manifestation) Say that an account of indeterminacy (and an attendant conception of (in)determinacy operators) entails that indeterminacy ‘weakly-manifests ϕ -ly’ iff, for some sentence S that is the subject of ϕ -theorising (or contains use of a ϕ -theoretic expression), ‘ ∇ S’ is true.

But, there is intuitively something stronger than this that you might mean by ‘manifests’ – something closer to the idea of being a ‘bearer’ of indeterminacy. Suppose that you want to say that it is indeterminate whether aborting a mid-term foetus is wrong. The only way the indeterminacy-as-unknowability theorist could make sense of that would be to claim that it is unknowable whether it’s wrong. But they *cannot* make sense of the thought that it might be indeterminate of the event of the abortion itself, *epistemic agents and relations aside*, whether it is wrong. An act and a moral property are just not the sort of relata between which an unknowability relation could hold – only epistemic agents and objects of knowledge are.^{74,75} In this sense, indeterminacy cannot *strongly*-manifest

⁷⁴ Even given realism about moral relations, the ‘indeterminacy is unknowability’ theorist can at most secure the claim that there is a sparse properties of Wrongness that is, in some sense, ‘metaphysically gappy’ – but one cannot say that it is indeterminate if one has identified indeterminacy with unknowability.

⁷⁵ Similarly, consider the claim that indeterminacy is *semantic* indeterminacy just in case any expression of the form ‘It’s indeterminate whether P’ can be paraphrased into ‘It’s indeterminate whether ‘P’ is true’ – the idea being that the paraphrase demonstrates the indeterminacy is really indeterminacy *about* semantic matters. This is clearly inadequate for two reasons. First, we’ve been offered no guarantee that the paraphrase is explanatorily prior – perhaps the proper direction of paraphrase is from the latter into the former. Second, there’s no reason to think that the subject matter of the complement is a good guide to the nature of the indeterminacy. Consider the claim that ‘It’s indeterminate whether Labour will win the next election’. That’s *about* politics – so the indeterminacy weakly-manifests in political phenomena. But we shouldn’t conclude that there’s a distinctive kind of *political indeterminacy*. The point, thus, is that mere weak-

morally, for *by its very nature*, it can only hold *in* epistemic phenomena (even though it can hold *of* non-epistemic phenomena). Similarly, they cannot say that it strongly-manifests semantically either: though it might be unknowable whether a sentence is true (thus, that indeterminacy could weakly-manifest semantically), it cannot be that how the sentence is with regard to its truth-value in and of itself (epistemic agents and relations aside), is unknowable – truth-bearers and truth-values are just not suitable relata for an unknowability relation. So, identifying indeterminacy as unknowability would prevent one from being able to say that it *strongly*-manifests non-epistemically.⁷⁶

If it helps, compare the modal case: if you think that necessity *is* analyticity, then you can say that necessity weakly-manifests metaphysically (e.g. by saying that, for example, compositional claims are analytic truths) while denying that it strongly-manifests metaphysically (that there's no sense in which the compositional facts themselves are necessary – they're not semantic entities, thus not evaluable for analyticity). Similar remarks apply to the thought that indeterminacy *is* the phenomenon of truth-value gaps: indeterminacy, so construed, cannot manifest non-semantically because *by its very nature*, it can only hold *in* phenomena comprising truth-bearers and truth-values. And further, to take a different nature thesis, if indeterminacy *is* gappiness in a sparse property, it could likewise be that indeterminacy

manifestation in some domain – as marked by the subject matter of the complement – is no guide to the nature of indeterminacy.

⁷⁶ The Strong/weak *metaphysical* manifestation distinction should not be understood as obviously corresponding to the de re/de dicto indeterminacy distinction. As we'll see below, there are theories of indeterminacy that allow indeterminacy to strongly-manifest metaphysically, but deny that it does so *de re*. Ultimately, it depends upon how you understand the de re/de dicto distinction. You *could* understand it as weak/strong manifestation, but you could also understand it as an operator taking wide or narrow scope over a quantifier. (I suspect that these are sometimes conflated.) However you construe it, the important point is that the weak/strong manifestation of some phenomena doesn't neatly correspond to the issue of how the attendant operator scopes over quantifiers.

could weakly-manifest semantically or epistemically whilst failing to strongly-manifest semantically or epistemically, should there be no sparse semantic or epistemic properties.

What's inhibiting strong-manifestation? Take the first case: I said that the problem here is that moral phenomena don't seem to be epistemic phenomena, whereas indeterminacy is, by supposition, an epistemic phenomenon. More carefully, even if moral phenomena *are* always partly epistemic – say, because morally evaluable actions must be individuated such that they always involve the epistemic state of a moral agent – their epistemicness seems to feature in the wrong way so as to host indeterminacy. Loosely, such epistemicness is a component of the morally evaluated element, rather than in how that element stands to wrongness.⁷⁷ But, how the evaluand stands to wrongness is not plausibly an epistemic phenomenon, and so cannot exhibit indeterminacy. While morally evaluable phenomena may be partly epistemic, the phenomenon of their *having some moral status* doesn't seem to be, and thus there's nowhere for indeterminacy (*qua* unknowability) to get a foothold *in* moral phenomenon. Thus, the inability for indeterminacy to strongly-manifest morally is bore of an incompatibility between the natures of indeterminacy and morality. More generally, and provisionally, let's just state this as follows,

(Strong Manifestation) Say that an account of indeterminacy entails that indeterminacy can 'strongly-manifest ϕ -ly' iff the nature of indeterminacy and the nature of ϕ -phenomena are 'compatible'.

⁷⁷ To see the inadequacy of this witness that, in many cases, the moral indeterminacy seems to remain even assuming the agent is maximally knowledgeable over the relevant issues. (For example, take the abortion case: suppose that the morally evaluable act includes the individual's knowledge about the foetus's development and chances of survival. The seeming indeterminacy of some of these cases seems independent of the agent's knowledge of these facts – they could know all there is to know about development and survivability and it still be indeterminate whether its wrong.)

This is all a bit hand-wavy, and we'll try and nail down 'compatibility' a bit more later on, once we have a few more resources to hand. Hopefully it is clear enough, for now, that there are two senses in which indeterminacy can 'manifest', the stronger of which is intimately connected with the nature question, such that we can also say that the following hold:

Some indeterminacy has a ϕ -nature iff some indeterminacy can strongly-manifest ϕ -ly.

All indeterminacy has a ϕ -nature iff all indeterminacy strongly-manifests ϕ -ly.

No such biconditionals hold of weak-manifestation. As such, (iii) should be split into two sub-questions, (iii^w) & (iii^s), depending upon which of strong or weak manifestation is being asked about.

1.3.4 Example responses

It's worth noting that our three questions are generic. So to illustrate them, let's ignore indeterminacy for a moment and look to alethic modality. You can likewise ask after the nature, source, or manifestations of alethic modality. You might, for instance, think that what modality *is* is just the phenomenon of there existing a plurality of spatiotemporally distinct concrete worlds, such that what it is to be possible that p , is for p to be the case at one of those worlds. Alternatively, you might think that what modality *is* is just the phenomenon of analyticity/syntheticity. Or instead, you might think that what modality *is* cannot be explicated at all – that it just has to be taken as primitive. Asking about the source of modal facts, however, is to ask something different altogether. Asking after the nature of a thing is to ask what's being sprinkled about, while asking after its

source is to ask why its being sprinkled one way rather than another.⁷⁸⁷⁹ Take the first case: you might think that the modal facts (i.e. facts about the existence of worlds) hold in virtue of nothing – that they’re fundamental existence facts. Alternatively, you might think that they hold in virtue of a decision of God’s: that it is possible that Labour will win the next election (i.e. there is a concrete world at which Labour *do* win the next election) because God makes such a world exist. Modal facts may hold in virtue of a range of things - existence facts, dispositional properties, essentialist facts, laws, chances, conventions - or maybe they’re just fundamental. Finally, consider manifestation. It seems pretty uncontroversial that modality manifests semantically – that ‘Labour won the last election’ could have been true – but does it manifest non-semantically too? Can Labour *itself* – semantic phenomenon aside - have the property of being possibly victorious, or possibly have the property of being victorious?⁸⁰

⁷⁸ It might be illustrative to here point to the analogous distinction with regard to some other debates. (1) The special composition question asks why composition occurs – why it’s sprinkled about as it is – whilst the general composition question asks after composition’s *nature* – with what’s being sprinkled. (2) Identity, everyone seems to agree, has a unique primitive nature, but there are various sortal-relative ‘criteria of identity’ that explain why it’s sprinkled about as it is. (3) Properties might be tropes, or sets, or universals – that is, their *nature* is controversial. But why is ‘spin’, whatever its nature, sprinkled as it is. That question, we might think, is an empirical matter. The answer to the nature question clearly *constrains* the answer to the source question. For instance, an answer to GCQ (i.e. a statement of the form ‘the xx compose y iff xxRy’) will clearly constrain the answers to SCQ (i.e. ‘ $\exists y(\text{xx compose } y) \text{ iff } (R_{xx})$ ’) insofar as xxRy iff Rxx. The thought is that the RHS here is, however, explanatorily prior to the LHS.

⁷⁹ It’s for this reason that Ramsifying on the claims made in earlier isn’t enough to provide an account of indeterminacy’s nature. Identifying indeterminacy with the realizer of the role so outlined, insofar as that is given by necessary and sufficient conditions for its occurrence, might mistakenly identify it with its source. Moreover, I assume there’s no useful functionalist identification of indeterminacy with the functional *role*, given both the fairly superficial characterization of that role, and the theoretical motivation to anyway be giving an account that explains *why* it plays that role.

⁸⁰ Compare also the debate about truth. Armstrong (2003) seems to think that the truth-maker principle is a way of cashing out a correspondence theory of truth. But, they seem to be answers to different questions. The truth-maker principle seems to answer a source question: it tells us why truth is sprinkled over truth-bearers in the way that it is. Correspondence theory, however, seems to tell us

Let's turn back to indeterminacy and look at some examples of the standard semantic/epistemic/metaphysical triad for illustration:

(S-i) Indeterminacy *is* a semantic or meta-semantic⁸¹ phenomenon.

Example: Indeterminacy is the phenomenon of semantic incompleteness.

(S-ii) Indeterminacy occurs *in virtue of* semantic or meta-semantic phenomena. Example: Indeterminacy occurs in virtue of hedging, or incomplete definitions, or semantic indecision.

(S-iii) Indeterminacy *manifests* in some semantic relation between sentences (or sub-sentential expressions) and their semantic values, or meanings, or referents. Example: 'F' is indeterminate, such that it is indeterminate whether the reference relation holds between F and some individual who is borderline 'F'.

(E-i) Indeterminacy *is* an epistemic phenomenon. Example: indeterminacy is the phenomenon of in principle unknowability about whether or not a sentence is true.

(E-ii) Indeterminacy occurs *in virtue of* epistemic phenomena.

Example: indeterminacy occurs because of certain epistemic safety principles.

about truth's nature: it tells us what's being sprinkled about. As such, deflationists should be able to accommodate the truth-maker principle, assuming they're deflationary about truth's nature and not *also* deflationary about its source.

⁸¹ Throughout, by 'meta-semantics' I mean what is sometimes called 'foundational', rather than 'descriptive' semantics. This includes investigation into the (semantic or non-semantic) grounds of sentential & sub-sentential semantic values (e.g. Lewisian conventions, reference magnets, principles of charity, dispositions, proper functions, descriptions, events of causal baptism etc.) as well as investigation into the nature of semantic properties (e.g. meaning, reference, satisfaction etc.).

(E-iii) Indeterminacy *manifests* epistemically in some epistemic relation. Example: it is possible that it is indeterminate whether some agent stands in the epistemic relation of 'knowing that' to some object of knowledge.

(M-i) Indeterminacy *is* a metaphysical phenomenon. Example: indeterminacy *is* the phenomenon of gappy sparse properties.

(M-ii) Indeterminacy occurs *in virtue of* metaphysical phenomenon.⁸² Example: Indeterminacy occurs because of the non-instantiation of certain sparse properties.

(M-iii) Indeterminacy *manifests* metaphysically in some paradigmatically metaphysical relation. Example: when it is indeterminate whether 'Fa', then it is indeterminate whether any fact is such that the grounding relation holds between it and the fact that Fa

These positions are such that, committing to one kind of answer (say epistemic) to one sort of question, doesn't obviously commit you to the same kind of answer for the other questions. For example, consider the following two combinations of views. First, suppose you think that indeterminacy obtains in virtue of meta-semantic underdetermination, and thus counts as having a semantic source. You may nevertheless think that what indeterminacy *is* is unknowability – it's just that you think that that unknowability obtains in virtue of meta-semantic underdetermination. Second, suppose that you think that what indeterminacy *is* is the

⁸² I think this, for instance, is how best to understand several extant accounts of metaphysical indeterminacy. For example, consider Rosen & Smith's (2004) account of metaphysical indeterminacy (or vagueness) as the phenomenon of an object vaguely instantiating a 'point' (precise) property (Rosen & Smith (2004)). As Barnes (2010) puts it, "though some or all of these might be potential *manifestations* of [metaphysical indeterminacy], none are *de jure* characterisations of the phenomenon itself." In our terms, they're accounts of metaphysical indeterminacy's *source*, not its *nature*.

phenomenon of semantic gappiness, but again, that it has its source in meta-semantic underdetermination. Both of these seem coherent, thus a semantic answer to the source question doesn't carry a *prima facie* commitment to a semantic answer to the nature question.⁸³

Moreover, the answers to any particular question aren't obviously exclusive. In response to the 'nature' question, it seems theoretically coherent to think that indeterminacy might be a disunified kind, such that a disjunctive account of its nature is appropriate. Also, the responses to the source question might cross-cut one another. For instance, suppose one holds the not uncommon view that a theory counts as a 'semantic' account because it sources indeterminacy in meta-semantic underdetermination. Nevertheless, one might think that the meta-semantic phenomena *also* constitute a *bona fide* metaphysical phenomenon, such that the source can be properly considered to be both semantic *and* metaphysical. Finally, consider manifestation. Suppose you think that indeterminacy manifests semantically. Nevertheless, you might also thereby think that (because of a commitment to realism about semantic properties) that this means that indeterminacy manifests *metaphysically* too, by yielding indeterminacy in whether a reference relation (*qua* sparse property) holds.

1.3.5 Why care?

These distinctions matter when it comes to grasping the difference between epistemic & epistemicist, semantic & semanticist, or metaphysical & metaphysicalist indeterminacy. To be clear, anybody who thinks indeterminacy can weakly manifest, say, epistemically, can be said to be a

⁸³ Of particular interest for us is the following possibility: if we have a linguistically driven ontology, such that we think that whatever objects there are is grounded in the truth of sentences (such as the view of Hale & Wright (2009)), then we might think that indeterminacy has a semantic source but a metaphysical nature. That is, we might think that there are, say, indeterminate objects sourced in semantic indecision over the relevant nominal expression.

proponent of epistemic indeterminacy. But to be a proponent of *epistemicist* indeterminacy is to commit to some stronger claim: either that indeterminacy is epistemically sourced, or that it has an epistemic nature (and, thereby, doesn't strongly manifest non-epistemically).⁸⁴ So, you can be either a *source*-epistemicist or a *nature*-epistemicist (and likewise for other ϕ -ists).

These distinctions thus allow us to more adequately categorise extant theories. Consider, for example, the view of Sorensen (2001), which Sorensen – along with most of the subsequent literature – judges to be 'epistemicist'. The crucial idea in Sorensen's account is that the ignorance characteristic of indeterminacy results from truth-maker gaps. As we'll see later on, this sort of view is also developed by Greenough (2008) as a way of making sense of *metaphysical* indeterminacy. So, which is it: epistemicist or metaphysical. The difference is simply over whether truthmaker gaps are considered as a mere *source* of indeterminacy, or whether it is a strong manifestation of indeterminacy. For Sorensen, indeterminacy *is* ignorance of a certain kind, one *sourced* in truth-maker gaps. For Greenough, however, truth-maker gaps are a *strong manifestation* of indeterminacy: a truthmaker-gap *is* a kind of indeterminacy, not a mere source of it.⁸⁵

⁸⁴ These 2 kinds of ϕ ist shouldn't be conflated. Consider two 'semanticists about indeterminacy' who express their views in the following ways: one may want to say "yes, we countenance epistemic indeterminacy, we just think it's sourced in semantic indeterminacy", while another may say "sure we think there is such a thing as unknowability that's symptomatic of indeterminacy, but it's deceptive to call that 'epistemic indeterminacy', because what indeterminacy *is* is semantic underdetermination." These theorists aren't having a merely terminological disagreement, they're 'semanticist' in two completely different senses – the first thinks that indeterminacy is merely semantically sourced, whilst the latter thinks that indeterminacy has a semantic nature.

⁸⁵ This difference in turn highlights important questions for theorizing about indeterminacy. First, what are the different explanatory roles of nature and source claims? Second, what should push us to view *metaphysical* phenomena as *more* than a mere source of indeterminacy?

A particularly important upshot of the distinctions is also that there are a ton of different ways we can understand the claim that ‘there is *metaphysical* indeterminacy’: some/all indeterminacy weakly-manifests metaphysically; some/all indeterminacy strongly-manifests metaphysically; some/all indeterminacy is partly/wholly sourced metaphysically; some/all indeterminacy has a metaphysical nature. It’s all too easy to equivocate between these when arguing for or against metaphysical indeterminacy, or when trying to put it to use.

Unsurprisingly, if we fail to pay careful attention to these various distinctions we can easily be lead into confusion. For example, if one had a knock-down argument that indeterminacy always has a semantic source, one wouldn’t have thereby demonstrated that there’s no such thing as metaphysical indeterminacy – that it doesn’t manifest metaphysically, or doesn’t have a metaphysical nature. So rather than just talking about ‘semantic’ or ‘metaphysical’ accounts of indeterminacy, I’ll always try to make it clear exactly which question is being dealt with in what follows.

As such, we can now clearly understand, once armed with our generic concept of indeterminacy, the precise questions we may be asking when we enquire into whether indeterminacy is ‘metaphysical’.

Summary

This chapter sought to delimit the basic pre-theoretical characteristics that seem to constitute the phenomenon of indeterminacy, with an eye to outlining a functional characterisation of a minimal concept of indeterminacy. I further then sought to give a characterisation of the explanandum of a theory of *metaphysical* indeterminacy, attempting to make clear exactly what properties such a characterisation should have if its to be dialectically persuasive to those sceptical of the phenomenon, and to critically examine some options. There I claimed that we should employ a functional characterisation of indeterminacy using the ingredients previously outlined. I subsequently sought to be explicit about what indeterminacy's being 'metaphysical' might consist in, distinguishing three ways in which 'metaphysical' might be thought to modify the functional concept of 'indeterminacy'. The upshot, thereby, has been not merely to get clear on the phenomena to be discussed in ensuing discussion, but to do so in a way that is hopefully satisfactory to those noisy detractors who take such theorising to be misconceived.

Chapter 2

The nature of Indeterminacy

In this chapter, I get to work on outlining what an account of the *nature* of indeterminacy might look like. I develop an abstract formal model that I claim is suitably generic enough to accommodate various substantive theories. Moreover, I aim to illustrate the utility of that model by employing it to distinguish some varieties of supervenientism. Finally, I seek to utilize those prior distinctions to undermine some recent efforts to quickly argue for metaphysical indeterminacy on the back of semantic considerations.

The project here, as I indicated above, is the meta-theoretical aim of plotting the space of token substantive theories – and it's that aim which this model is intended to serve. The utility of such is four-fold. First, it can allow us to spot hitherto undeveloped or unexplored token theories. Second, it can help move us toward confidence that we have a suitably comprehensive map of token theories with which to perform cost-benefit analysis of those theories. (It's a sensible constraint on any such analysis that it be conducted on a reasonably comprehensive set of options: any bad theory can score relatively well on cost-benefit analysis relative to an impoverished set of options. As such, our confidence in the verdict of any such analysis is partly a function of our confidence in the comprehensiveness of the options surveyed – and it's partly such which the meta-theoretical task of this chapter can serve.) Third, it allows us to see theoretically important properties of token theories, allowing us to better understand how it is that such theories work. Fourth, bringing such

properties into greater relief can aid in our appraisal of arguments and controversies concerning such theories, as I'll show near the end of the chapter.

2.1 The nature of indeterminacy

So, down to business: what *is* indeterminacy – what is the *nature* of it?

Unlike the case of providing a characterisation of the explanandum, there is little hope here of offering a particular neutral account.⁸⁶ Nevertheless, I think we can define a fully general account of the *space* of theories that will be useful for systematising the choices involved in such an account, and for organising particular accounts of *metaphysical* indeterminacy.

2.1.1 Indeterminate truth and beyond

The options for substantive theories of indeterminacy in general can be straightforwardly mapped by abstracting from some of the details of the options for making sense of indeterminate truth. This section explains clearly how to do that, and thereby outlines some of the choice-points in constructing a theory of the nature of indeterminacy. Applying this to the particular case of *metaphysical* indeterminacy will then involve a straightforward reinterpretation of the formal structure so defined. Further, seeing how such abstract structural features serve the explanatory role of accounting for features of the explanandum will hopefully further sell the legitimacy metaphysical indeterminacy, by highlighting its sharing structural features with more orthodox theories of indeterminacy.

One way of characterising different views of the nature of indeterminacy is via their interpretation of a possible-worlds-style semantics for

⁸⁶ Cf. Smith (2008) p.131.

determinacy operators. That is useful for some purposes - however, it is much too coarse for the purpose of discussing accounts of the nature of indeterminacy. Instead, to frame the issue, let us look instead at the claims of classical truth-value assignments for propositional language. Such a theory comprises the following^{87,88}:

- S-a) A boolean algebra comprising: (i) a set of truth values $T=\{0,1\}$ ordered such that $0<1$; (ii) three operators defined on this set, including two binary operators ‘ \sqcap ’, ‘ \sqcup ’ (taking us to the infimum and supremum of their inputs respectively), and a unary operator ‘ $*$ ’ (which takes us to the complement of its input).
- S-b) A language and syntax comprising: (i) a set of sentential constants S , three syncategorematic sentential connectives (&, \vee , and \neg), and punctuation; (ii) a defined set of well-formed formulas exhausted by sentential constants and complex sentences built of those constants and the sentential connectives.
- S-c) An ‘interpretation’ \mathcal{I} , a function which assigns a truth-value $[s]_{\mathcal{I}} \in T$ to every $s \in S$, and a recursive definition of the truth-values of complex sentences by associating the sentential connectives with the algebraic operators such that ‘&’= \sqcap , ‘ \vee ’= \sqcup , and ‘ \neg ’= $*$.
- S-d) Truth *simpliciter*: (i) Truth *simpliciter* is identified with truth on the *intended* interpretation \mathcal{I} – viz, that interpretation that is intuitively ‘correct’, as fixed by the relevant meta-semantic facts;

⁸⁷ This section is indebted to Smith (2008), p24-32. Smith construes this as classical *semantics*, but I’ll reserve that term for the related account of interpretations *qua* assignments of *content*.

⁸⁸ I will ignore various nuances regarding appropriate indexes for this account. However, there are issues worth considering here. For instance, contextualist accounts view indeterminacy as a *dynamic* phenomenon. There’s a good question, then, on that view, whether what changes over time is the interpretation for a given language, or the language itself. That’s tantamount to asking whether we should place a temporal index on the interpretation or on the (uninterpreted) language, which in turn depends upon questions about the individuation and persistence of languages. This is, of course, a can of worms, so I’ll set it aside.

(ii) The meta-semantic facts are such that there is a unique intended interpretation.⁸⁹

A distinct claim, which isn't properly considered strictly part of the classical package, but that will be worth considering, is the following strengthening of (S-d)(ii):

ii+) 'There is an interpretation such that it is determinately intended.
(With the corollary that there is some assignment of truth-*simpliciter*-values such that it is determinately correct.)

If (ii+), unlike (ii), were considered part of the 'classical' package, the epistemicism of Williamson (1994) and non-standard supervaluationism of McGee & Mclaughlin (1995) would turn out to be non-classical, contrary to what is widely claimed. One might, thereby, try to push for (ii+) as part of the classical package as grounds for judging them as non-classical after all. That seems like a tall order to me, but nevertheless, it'll be useful to have (ii+) around for what follows.

What's of immediate importance for us is that the foregoing picture involves a model whereby languages stand in a relation of 'being intended' to an interpretation. The crucial features determining its classicality are that⁹⁰:

- S-I. The assignments are *binary*;
- S-II. The interpretation is a *total function* (thus, each interpretation is consistent and complete);
- S-III. Assignments to compounds are *truth-functional*;
- S-IV. There is a *unique* intended interpretation.

⁸⁹ As a corollary, there is a unique assignment of truth-*simpliciter*-values.

⁹⁰ Cf. Smith (2008)

Again, in relation to (ii'), we should pay attention to a strengthening of (S-IV):

S-IV+. There is an interpretation such that it is determinately intended.

S-I, S-II, and S-III constitute 'classical semantics'. S-IV is a central assumption, or upshot, of what we might call 'classical meta-semantics'.

'Nature-semanticist' accounts of indeterminacy identify it with the negation of one of (S-I), (S-II), (S-IV) or (S-IV+).⁹¹ Those who reject (S-I) or (S-II) may or may not reject (S-III).

Smith (2008) maps extant accounts of vagueness by locating them according to their position with regard to these claims. What's crucial for us to note, however, is that these options point to a much more general model of indeterminacy. That is, we can think of every kind of substantial account of the nature of indeterminacy as having the form of one of these options with respect to a structure which 'classically' has a form like (I)-(IV).

Let's take the 'nature-epistemicist' as an example, since most such accounts give an account of indeterminacy that does not question S-I-SIV.

Epistemicists reject S-IV+, if 'determinately' is interpreted epistemically. However, we can more perspicuously characterise their view by appeal to an epistemic variant of the above structure. The characteristic claim of Williamson's (1994) epistemicism about *vagueness* is that the vagueness

⁹¹ This isn't quite exhaustive: they might identify it with a more refined phenomenon that treats it as some such negation *with a particular source*. We'll return to this shortly.

suffered by borderline cases of vague predicates consists in an in principle unknowability about whether the case in question is satisfied by the predicate, due to an in principle unknowability about the meaning of the predicate. We can imagine a Williamson-style position about *indeterminacy* that characterises what indeterminacy *is* as in principle unknowability.⁹² Moreover, we can establish an analogous structure to that above for an agent's epistemic state as follows. Consider a model whereby an epistemic agent stands in a relation of 'knowability' to certain states of knowledge.

- E-a) A boolean algebra comprising: (i) a set of Knowability values $K=\{0,1\}$ – intuitively, 'Knowably true' and 'Knowably false' – ordered such that $0 < 1$; (ii) three operators defined on this set, including two binary operators ' \sqcap ', ' \sqcup ' (taking us to the infimum and supremum of their inputs respectively), and a unary operator '*' (which takes us to the complement of its input).
- E-b) A language and syntax comprising: (i) a set of sentential constants P , and three syncategorematic sentential connectives (&, \vee , and \neg), and punctuation; (ii) a defined set of well-formed formulas exhausted by sentential constants and complex sentences built of those constants and the sentential connectives.
- E-c) An 'interpretation' \mathcal{I} is a function, which assigns a K -value $[p]_{\mathcal{I}} \in K$ to every $p \in P$, and a recursive definition of the truth-values of complex sentences by associating the sentential connectives with the algebraic operators such that '&'= \sqcap , ' \vee '= \sqcup , and ' \neg '=*
- E-d) Knowability *simpliciter* (for an agent A): (i) Knowability *simpliciter* (for A) is identified with knowability on the *intended* interpretation \mathcal{I} – *viz*, that interpretation that is intuitively

⁹² I'll ignore, for the moment, the more nuanced idea that its nature is unknowability *of a particular kind* – i.e., that sourced in meta-semantic fragility and epistemic safety principles.

‘correct’ as a description of A’s epistemic state, as fixed by the knowledge determining facts; (ii) The meta-epistemic (knowledge determining) facts are such that there is a unique intended interpretation.

This model thereby has the following analogues to SI-SIV⁺:

- E-I. The assignments are binary;
- E-II. The interpretation function is total (thus, each interpretation is consistent and complete);
- E-III. Assignments to compounds are knowability-functional;
- E-IV. There is a unique intended interpretation.
- E-IV⁺. There is an interpretation such that it is determinately intended.

The ‘nature-epistemicist’ about indeterminacy will identify it with the negation of one of (E-I), (E-II), (E-IV) or (E-IV⁺).⁹³ Those who reject (E-I) or (E-II) may or may not reject (E-III). The position closest to Williamson rejects E-II: it deems that borderline cases of a predicate are cases where it is neither knowable that the predicate is satisfied, nor knowable that it is unsatisfied.⁹⁴ Any model of an agent’s epistemic state in such a situation must, thereby, be such that it fails to map indeterminate sentences to members of *K*, and thus the interpretation function must be partial for that

⁹³ This isn’t quite exhaustive: they might identify it with a more refined phenomenon that treats it as some such negation *with a particular source*. We’ll return to this shortly.

⁹⁴ Assuming the K-values are read, as I stated, as ‘Knowably true’ and ‘Knowably false’. If they’re read simply as ‘Knowable’ and ‘Unknowable’, then there would be no reason to deny E-II. This is analogous to the situation of the proponent of truth-value gaps with regard to a model where the T-values are interpreted as ‘True’ and ‘Untrue’.

agent. This kind of epistemicist indeterminacy, thus, can be understood as a knowability-gap, rather than – as before – a truth-value gap.⁹⁵

Clearly, the *mere* rejection of E-II doesn't uniquely characterise those who think indeterminacy's nature is epistemicist, for it is also rejected by many theories of indeterminacy which have (unlike Williamson) a non-classical semantics – indeed, any theory which posits truth-value gaps via a partial interpretation function *must* (assuming knowability is factive) deny E-II too. What distinguishes the knowability-gap epistemicist is that she *identifies* indeterminacy with the failure of E-II.

2.1.2 - A general model of indeterminacy:

The sorts of models above are instances of a general kind, one that can accommodate various particular theories of the nature of indeterminacy, whether it is taken to have a semantic, epistemic, metaphysical, contextual, pragmatic, or psychological nature.⁹⁶

To be explicit, then, here is that general model:

- 1) Introduce a quadruple $\langle L, S, I, A \rangle$, such that L is a set of objects, S a set of objects, I a set of relations from L into S , and A contains a member of I .
 - i) Call L the *Locus* of (in)determinacy. Intuitively, it is the thing that 'suffers from' or 'exemplifies' (in)determinacy,

⁹⁵ That is, *not* as mere ignorance or uncertainty. Keep in mind that 'K' in this model represents knowability, not knowledge. For that sort of view - or perhaps what is better called *uncertainty without ignorance* - see Black (1937).

⁹⁶ I assume that those, like Field (1994), who think that little more can be said about the *concept* of indeterminacy beyond its introduction and elimination rules, are either effectively *agnostic* about its nature (and source), or endorse a primitivist view of its *nature*.

and whose members intuitively ‘suffer from’
(in)determinacy.

- ii) Call \mathcal{S} the ‘states’ of a locus. Intuitively, it is a set the (exclusive and exhaustive) possible ways any *member* of the locus could be in.
- iii) Call \mathcal{I} the ‘interpretations’ of a Locus. Intuitively, it is a set of the (exclusive and exhaustive) possible ways a *locus* could be in.
- iv) Call \mathcal{A} the ‘accurate interpretations’. Intuitively, it is the interpretation(s) that correctly represents the locus – the way(s) the locus actually is.

2) At least one of the following is the case:

- a) $|\mathcal{S}| > 2$
- b) There’s some $i \in \mathcal{I}$ such that it is not a total function.
- c) $|\mathcal{A}| \neq 1$
- d) There is no \mathbf{a} such that, determinately, $\mathbf{a} \in \mathcal{A}$ ⁹⁷

Call this the ‘LSIA-model’ of (in)determinacy. The LSIA-model, I claim, is (almost) broad enough to incorporate all theories of indeterminacy’s nature. Theories of indeterminacy are often glossed by way of some formalism or other – many by way of a possible worlds-style semantics for the indeterminacy operator. That’s very useful for the purposes of providing a logic and semantics for ‘ Δ ’, but it isn’t entirely perspicuous for the purposes of discussing indeterminacy’s nature. The LSIA model will, I claim, enable us greater clarity to that end.

⁹⁷ Clearly any *analysis* of indeterminacy built on this will fail to be reductive due to the presence of the term ‘determinately’ in (2d). This option is expressed as such in order to allow theoretical space for a primitivist theory of indeterminacy, so it should be unsurprising (and considered untroublesome) that our definition fails to be reductive in exactly that case.

Anywhere indeterminacy might strongly-manifest – semantically, epistemically, metaphysically etc. - can be modelled as above by giving an appropriate interpretation to *L*. If you think that indeterminacy can strongly-manifest semantically, then *L* should be interpreted as a language; if epistemically, as a set of suitable objects of knowledge; if metaphysically, maybe as a set of facts. As such, a *Locus* of indeterminacy is anywhere indeterminacy can strongly manifest: it is the indeterminacy-bearer.

But theories don't just disagree about *where* indeterminacy strongly-manifests, but also about the 'character' of the indeterminacy. An account of the character of the indeterminacy consists in providing a choice from (2). For example, opting for (a) corresponds to positing either a 'third-way' ($|S| = 3$) or 'degreed' ($|S| > 3$) conception of indeterminacy; (b) to the conception of indeterminacy as state (e.g. truth-value) gaps or gluts; (c) to the conception of indeterminacy as plurality or defectiveness.⁹⁸ As it stands, this gloss on 'character' isn't maximally perspicuous – it conflates some important distinctions. We'll give a fuller treatment of character below.

So, a theory of the nature of indeterminacy partly consists in the following: (i) an interpretation of $\langle L, S, I, A \rangle$; (ii) a choice of one of 2(a)-(d); and (iii) a type-identity claim of the form 'Indeterminacy *is* the phenomenon characterised by (i) & (ii)'.

Why do I say 'partly'? There are two reasons. First, an account might, as I stated above, hold that 'indeterminacy' marks a disjunctive kind, and thus has a disjunctive nature. As such, an account of its nature may identify it with a bunch of interpretations of $\langle L, S, I, A \rangle$ or a bunch of characters. One class of theories of this kind permits *any* interpretation of $\langle L, S, I, A \rangle$,

⁹⁸ In the semantic case, for the former consider Smith's (2008) plurivaluationism, and for the latter consider Sider & Braun's (2007) nihilism.

effectively identifying indeterminacy with a particular character (e.g. with gappiness *tout court*). Call these accounts ‘generalist’. On generalist accounts, since they are liberal about interpreting $\langle L, S, I, A \rangle$, indeterminacy is thereby not tied to some restricted set of loci, and so might strongly-manifest in many. ‘Localist’ theories, by contrast, are not so liberal. Clearly there’s a continuum of positions between them, wherein many pluralist accounts lie.⁹⁹ Second, some accounts supplement (1)&(2) with a source requirement, thereby picking out a narrower kind of phenomenon. An example of this was mentioned above as the more nuanced view associable with Williamson: that indeterminacy is unknowability *that holds in virtue of meta-semantic plasticity and epistemic safety principles*, rather than unknowability *tout court*. Call these accounts ‘sourced’.

So, more carefully, an account of the nature of indeterminacy consists of:

- (Arena) A set of interpretations of $\langle L, S, I, A \rangle$, which constitutes the structure in which indeterminacy can strongly-manifest;
- (Character) A choice of at least one of 2(a)-(d);
- (Source) A (possibly null) source constraint;
- (Type-identity thesis) A type-identity claim of the form
‘Indeterminacy *is* the phenomenon so defined.

Does *any* way of filling in these variables specify a candidate nature of indeterminacy? I see no reason to deny that – though, of course, many such candidates will be crazy. Crazy as such accounts may be, though, their

⁹⁹ I don’t see that such pluralism conflicts with the claim in chapter 1 to have given a unique *concept* of indeterminacy. First, as I said there, that concept is neutral over such issues. Moreover, there seem to be other plausible examples of concepts that apply to disunified phenomenon, such as WATER, H₂O, & H₃O. The point is that concepts can be as coarse-grained as suits one’s cognitive purposes, and in ordinary contexts those purposes may well exclude the issues uncovered in philosophical theorising that demand finer-grained conceptions of the relevant phenomena. Uncovering that the relevant phenomenon is disunified no more impugns the coherence or utility of the coarse concept any more than the discovery of distinct shades of red undermines the coherence or utility of the term ‘red’.

failure should be expressed as a failure of their being *good* candidates, not as their failing to be candidates at all. So, what makes for a *good* account of the nature of indeterminacy? We'll discuss this more fully later on, but for now let's say that any good account should give an analysis of its nature that (if paired with independently plausible further claims) allows it to (a) play the role carved out by our characterisation of the explanandum, in furnishing a plausible set of explanations for the various putative features of indeterminacy so outlined; and (b) by how well it fares in the wider theory (as per questions (ii-ix)) within which it could be embedded.

2.1.3 Character:

I said above that the LSIA-model is impoverished in one respect: it doesn't perspicuously distinguish the various 'characters' indeterminacy might have. In this section I want to refine (2) by outlining much more clearly what those options are. Which of these one opts for has ramifications throughout the entire theory of indeterminacy – not least because many arguments about indeterminacy are sensitive to some of these choices.

Indeterminacy concerns something standing in respect of something else – that is, a relational structure representable by interpreting the Arena. In the two most familiar cases, indeterminacy concerns how a *sentence* stands to (is interpreted by) some *content*, or how a *sentence* stands to (is assigned) a *truth-value*. That is what part 1 of the LSIA structure models. Making a choice about character amounts to saying *how* an Arena suffers indeterminacy.

For clarity, let's focus on the truth-value status of a sentence 'S' as the Arena at issue. That is, we'll assume that:

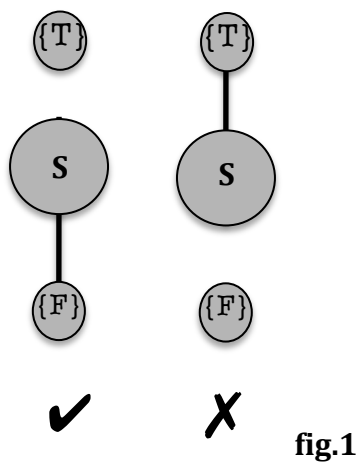
L = a sentence 'S'

S = a set of truth-values

I = a set of truth-value assignment relations

A = the *accurate* assignment relation

S in effect tells us the possible token truth-values (for the moment, let's assume that truth-values are set-theoretic entities), I the possible token truth-statuses, and A the actual truth-value status. Absent indeterminacy, we might think that something like the following structure adequately represents this:^{100,101}



That is, we might suppose that there are (a) two truth-values, True & False, that the sentence could be in; (b) truth-value assignments map exactly one truth value to the sentence; and (c) selection of exactly one of these assignments accurately represents the truth-value status of the sentence. Call this sort of conception of any structure 'The Simple Conception'.

¹⁰⁰ Here, the sentence 'S' is the *locus*, the two alternative assignments are the *interpretations*, {T} and {F} the *states*, and the tick and cross denote *accuracy*.

¹⁰¹ I make no assumptions as to what 'T' and 'F' stand for. Perhaps they're primitive 'third-realm' logical entities, or equivalence classes of propositions, or sets of worlds etc.

How could we revise the simple conception to make sense of indeterminacy strongly manifesting in truth-value assignments? We can blame each of (a), (b), and (c). First, we can blame the representation of the states – we can claim that figure 1 doesn't *exhaustively* represent the possible truth-values. Second, we can blame the relation – we can claim that figure 1 misrepresents the formal features of the *assignment relation*. Third, we can blame the *selection relation* – we can claim that figure 1 misrepresents the situation with regard to which is the *accurate* assignment relation.

The alternatives in any such diagram represent the exclusive and exhaustive possibilities for any *token instance* of the relevant structure. (a) and (b) effectively determine the space of possibilities. (c), by contrast, tells us which of those possibilities are *actual*. For ease of presentation, I've represented it diagrammatically with a tick and cross, but it's more perspicuous to view it as a relation. The relata in question are *I* and reality – reality determining which of the possibilities amongst *I* are actual. In many cases, we can focus on some particular portion of reality: for instance, where we're talking about accurate (i.e. 'intended') *semantic* interpretations of a *language*, the relevant portions of reality are the meta-semantic facts; where we're talking about accurate the *epistemic* profile of an agent, the relevant portions of reality are the meta-epistemic facts.

To see the contrast between these three choices, consider accounts that diagnose indeterminacy as a 'truth-value glut'. This idea shows up in three variants, corresponding each of the above choices. First, one can revise (a) – the set *S* of truth-values – by admitting a *glutty truth-value*:

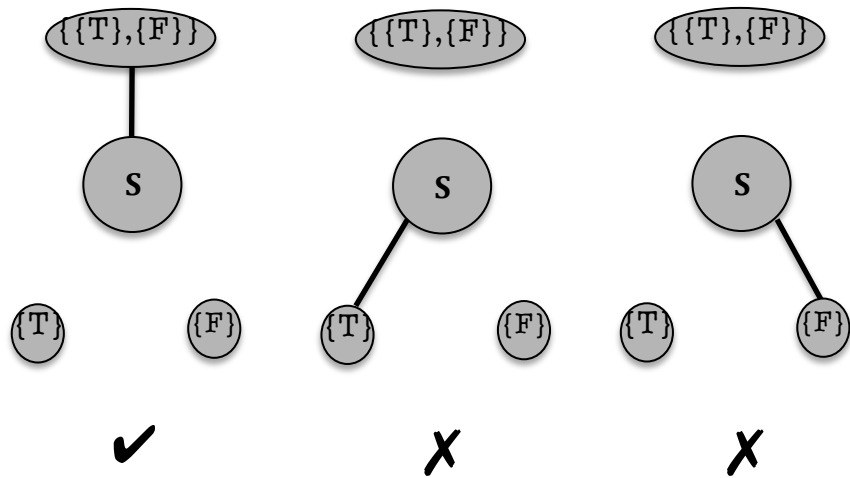


fig.2

That is, we stick with the idea that assignments map exactly one truth-value to the sentence, and that exactly one such selection accurately represents its truth-value status, but we countenance a new truth-value that is constructed out of our usual Boolean values.

Second, we might revise (b) – the set I of truth-value assignment relations – and claim that the assignment relation is *non-functional*:

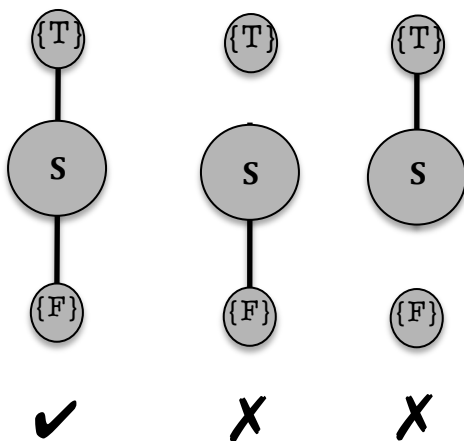


fig.3

That is, we stick with just our Boolean values, and the idea that exactly one selection accurately represents its truth-value status, but we deny that assignments must map *only* one truth-value to the sentence.

Third, we might revise (c) – and thus the set A of *accurate* assignments – and claim that *multiple* assignments are accurate. Conceive of A , as suggested above, as a ‘selection’ relation from reality to possibilities – of reality selecting amongst those possibilities. As such, this option is tantamount to claiming that the *selection* relation is non-functional:

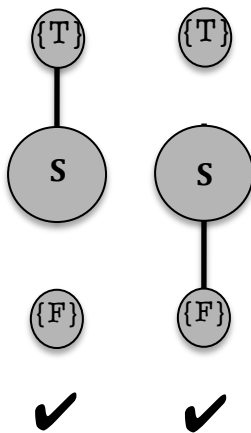


fig.4

That is, we stick with just our Boolean values, and the idea that assignments map only one truth-value to sentences, but we claim that there are *multiple* accurate assignments. In effect, this amounts to a denial of the exclusivity of the alternatives. Recall, the alternatives represent the exhaustive and *exclusive* possibilities for a *token instance*. As such, to make sense of their non-exclusivity (i.e. compossibility) we must deny that there is a *unique* accurate assignment (i.e. a unique token instance), and claim instead that there are multiple *token assignments*. In this case, then, the alternatives are reinterpreted such that they represent *distinct* token assignments – effectively, thereby, denying that the alternatives correspond one-one to possible *worlds*. This has an important upshot: in figure 4, it is true that ‘{T} is an accurate assignment’ and true that ‘{F} is an accurate assignment’, but it is *not* true that ‘{T} & {F} is an accurate assignment’ – that would only be true if the assignment relation itself were non-functional. Thus, on a type-3

glutty view, 'accurate assignment' – or an operator expressing such - is non-adjunctive.

So, there's a difference between having a glutty truth-value and having a truth-value glut, and there's even two different ways one could have a truth-value glut – by having a unique non-functional assignment, or by having multiple accurate assignments.

I'll imaginatively call the variants amending (a), (b), and (c), 'type-1', 'type-2', and 'type-3' indeterminacy. These are the different 'species' of indeterminacy – they're choices about *where* to modify the structure in figure 1. However, there's more to character than just species. I exemplified the species above by discussing 'gluttiness'. But there are other kinds of phenomenon theorists have been attracted to in characterising indeterminacy: gappiness and degressedness.

These are the different 'flavours' of indeterminacy – they're the choice of *how* to modify a part of the structure in figure 1. Moreover, some have maintained that we should reject gappiness, gluttiness, and degressedness, and instead be *primitivist*: we should not (indeed, we cannot) characterise *how* the structure is modified any more descriptively than by just saying that it is 'indeterminate'. This is *not* agnosticism between the other flavours, but a new flavour in its own right. Indeterminacy's character, then, comprises a species and a flavour.

It's simple enough to give a rough gloss of the flavours. Gluttiness treats indeterminacy between two alternatives to consist in *both* of those alternatives somehow obtaining. Gappiness takes it to consist in *neither* of those alternatives obtaining. Degreedness takes it to consist in gradability of some kind or other. Primitivism, of course, is such that nothing further can be said about it.

Let's introduce them by looking first at the different flavours of type-1 indeterminacy – those that modify the states. All type-1 views *supplement* the possible states. In the case of truth, they amount to the rejection of a *Boolean* algebra of truth-values. Above, I interpreted a *glutty* truth-value as $\{\{T\},\{F\}\}$, the idea being that a *glutty* truth-value would be built out of *both* of truth and falsity. The *gappy* variant, unsurprisingly, will construct it out of *neither* - it'll appeal to the null set:

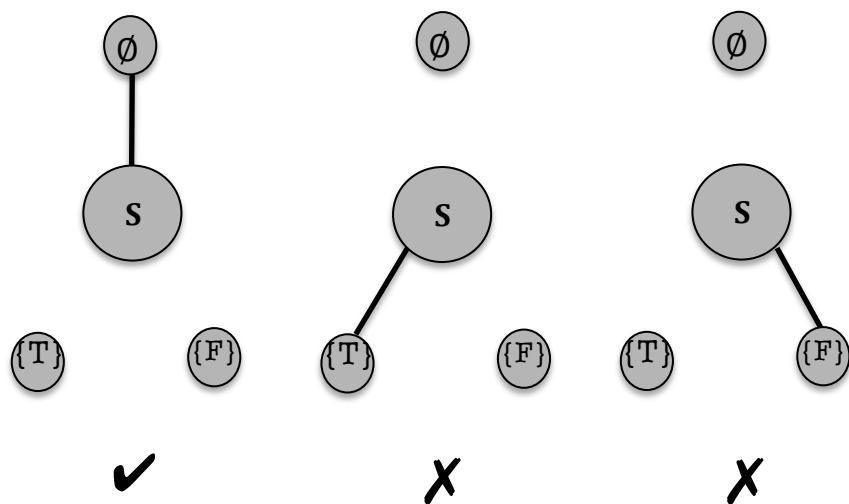


fig.5

The *degreed* variant will countenance as many truth-values as there are degrees. The most straightforward way is just to employ numbers as values. If there's only three degrees, that just involves the addition of a 'half' value:

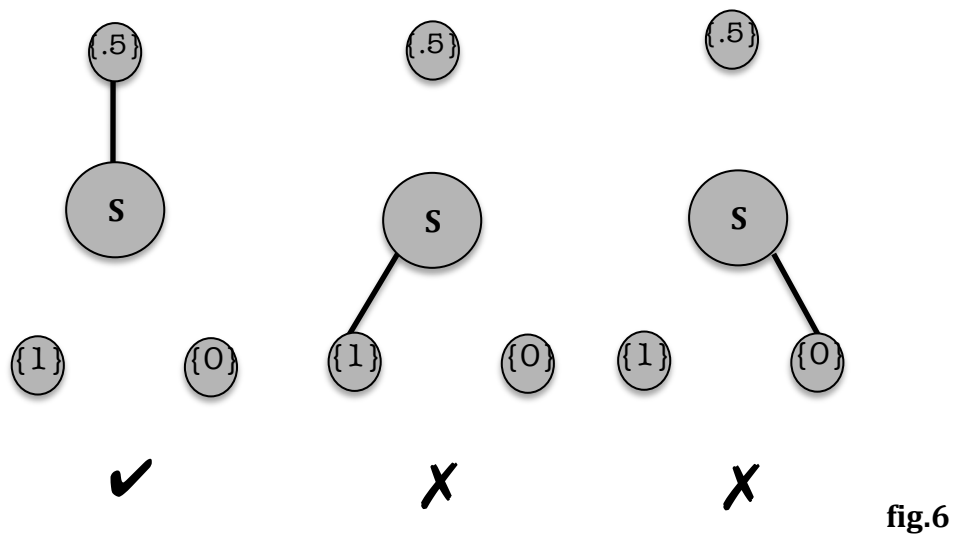


fig.6

If you want more, you can just appeal to the unit interval. Alternatively, maybe intricate set-theoretic constructions like those above may be appealed to - for example, by appealing to the power-set of $\{T, F, \emptyset\}$, or the power-set of that set, and so on.

The primitivist variant will introduce a new primitive truth value, denying that we can say anything informative at all about it beyond saying that it is an 'indeterminate truth-value':

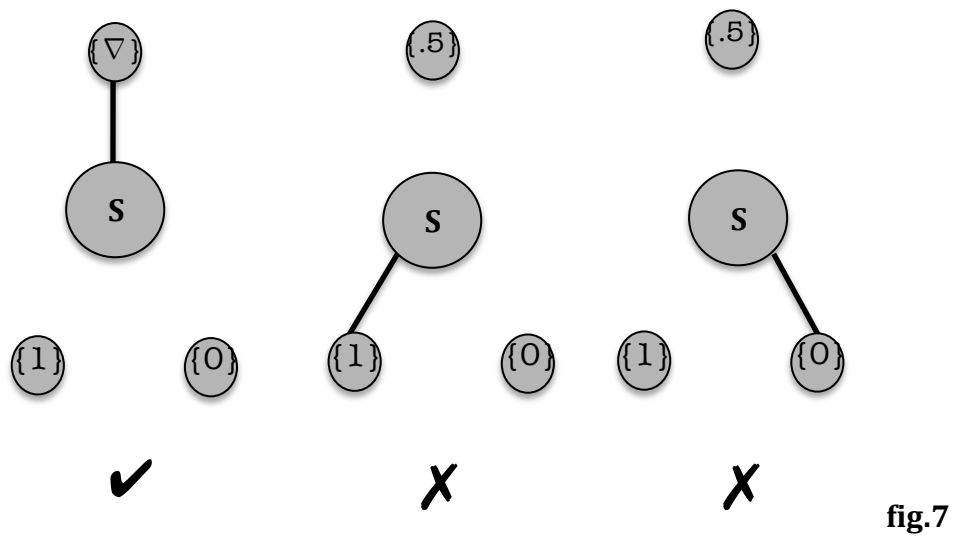


fig.7

Of course, the metaphysics of truth-values is itself controversial, so the assumption that truth-values are set-theoretic constructions like these is

not uncontroversial.¹⁰² Perhaps truth-values are not sets. Perhaps they're not even structured entities, but rather just primitive abstracta. Perhaps even the assumption of realism is misplaced. These considerations emphasise two pressing questions. First, once we've opted for a type-1 view of indeterminate truth, does it matter which flavour we adopt - are they just representational variants?¹⁰³ Second, why opt for any flavor at all – why not just say that there are more than two truth-values, and leave it at that? There's skepticism here, then, about the theoretical utility of the notion of flavours for a type-1 view: that we needn't given anything more than a *functional* characterization of indeterminate truth-values, should we countenance them.

It's tempting to appeal to the theoretical role of truth – in particular its relationship to consequence – to try and rescue the import of flavours here. However, I see little prospect of that working out.^{104,105} I'm inclined to be more concessive: in this case, perhaps the indeterminacy of truth-values

¹⁰² An example of the idea of set-theoretical gappy/glutty truth-values like this can be found in Dunn (1976) and Belnap (1977).

¹⁰³ Indeterminacy aside, consider the situation with Falsity: it's tempting to think that falsity is just an *absence* of truth. That might incline us to treat Truth as the sole truth-value, and to treat the assignment function as non-total. But is there really anything substantive in the choice between that and the pairing of a total function with a Falsity truth-value?

¹⁰⁴ Though, such considerations do make extension of this skepticism to indifference about *how many* truth-values are countenanced implausible. That being granted, it might still be pressing against the distinct flavours of *three-valued* accounts represented in diagrams (2), (5), (6), and (7).

¹⁰⁵ Consideration of the theoretical-role of truth-values does, however indicate an aspect of the choice between *type-1 and type-2* views of indeterminate truth. One seemingly core role of truth-values is that they comprise the range of truth-conditions. For the type-1 case, for a gappy truth-value to be countenanced it must be the case that truth-conditions comprise conditions sufficient for the truth-value, falsity-value, and null-value. Generally, there must be an *additional* condition that comprises truth-conditions governing the indeterminate value. By contrast, in the type-2 case, a truth-value gap requires, instead, non-exhaustive truth-conditions. Whether we should countenance a type-1 or type-2 view can, then, be fought by proxy, by considering the meta-semantic plausibility of non-exhaustive truth-conditions versus tripartite truth-conditions. Similar proxy means arise from considering consequence: type-2 gaps seemingly demand a paracomplete logic, whilst type-1 gaps demand a trivalent logic.

can be understood in merely functionalist terms. But, this doesn't suffice to show that flavours are theoretically useless for distinguishing amongst *other* species (type 2 and 3) of indeterminate truth, nor for distinguishing amongst type-1 views at loci other than truth.¹⁰⁶

If you don't wish to supplement the set of Boolean truth-values, *a la* type-1 view, type-2 and type-3 views offer an alternative. Type-2 views amend the assignment relation. The glutty variant, as we saw, claimed that the relation is non-functional. The gappy variant, as you may have guessed, claims that it is partial:

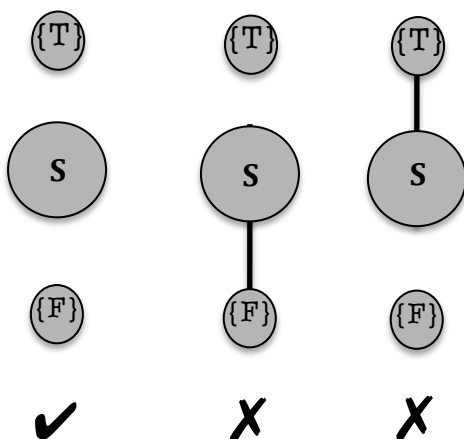
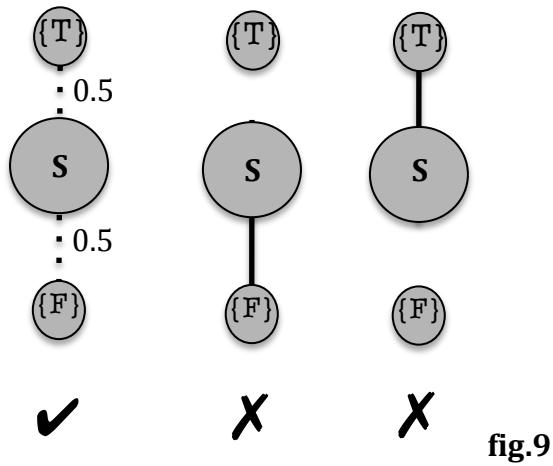


Fig.8

While the degreed variant countenances a degreed relation:¹⁰⁷

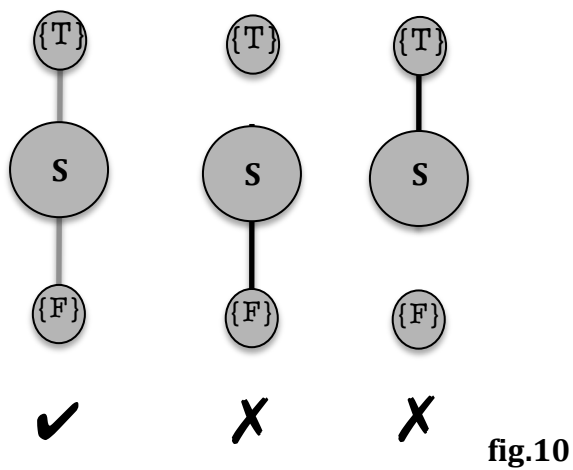
¹⁰⁶ Consider, for instance, truth-conditional content. It's less compelling that glutty content - comprising a non-exclusive extension and anti-extension - and gappy content - comprising a non-exhaustive extension and anti-extension - are mere notational variants. Plausibly, these will yield truth-value gluts and gaps respectively, and will so impact on the choice of an appropriate consequence relation.

¹⁰⁷ Consider, for instance, Bob's being a half-brother of Bill. Bob does not stand in a relationship of brotherhood to a 'half-Bill', whatever that may be. Nor is it half-correct to say that he is Bill's *full* brother. Rather, being a half-brother is a distinct kind of relation.



If the relation is to be describable set-theoretically, this will require an appropriately degreed notion of set-membership, such as the fuzzy sets of Zadeh (1975).¹⁰⁸

The primitivist variant countenances a new primitive relation:



If the relation is to be describable set-theoretically, this will require a corresponding primitive notion of indeterminate set-membership.

¹⁰⁸ Motivated by concern about higher-order indeterminacy, Zadeh (1975) combines Type-1 degreed and Type-2 degreed indeterminacy of truth.

It's pretty clear that choice of flavour amongst level-2 views of indeterminate truth will have considerable import for logical consequence. The choice between the glutty and gappy variants, for instance, amounts to choosing between a paraconsistent or paracomplete logic for indeterminacy. So, flavour matters.

Finally, then, level 3 species. Whereas we previously considered modifying the interpretation relation, we here consider modifying the 'accuracy' relation. The options are essentially the same, just applied at a different 'level' in the structure.

The glutty case, which we met above, countenanced multiple accurate (functional) assignments: it claimed that the selection relation is non-functional. The gappy conception deems the accuracy relation to be non-total. Since, however, the accuracy relation is a function from *reality* in its most exhaustive sense (reality *in toto*), this amounts to the failure of any of the alternatives to obtain, and thus to a kind of defectiveness.¹⁰⁹

¹⁰⁹ It's important to remember that we're after an account of the *nature* of indeterminacy here, and thus that the 'loci' represented – a sentence *qua* truth-bearer – is the candidate for the *strong manifestation* of indeterminacy. In ignoring this, it's tempting to think that epistemicism is representable as per figure 11, by interpreting the accuracy relation epistemically, so that 'x' is understood as 'unknowable'. That's a mistake: for the epistemicist, indeterminacy only *weakly* manifests semantically. However, these diagrams are by stipulation such that the large circle is reserved solely for the hypothesized loci or 'bearer' of indeterminacy.

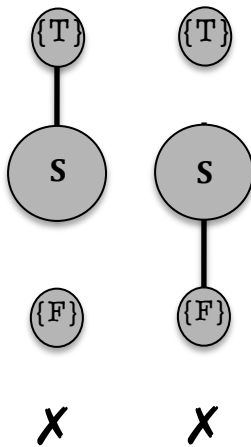


Fig.11

As you'd expect, the degreed variant claims that accuracy is degreed:

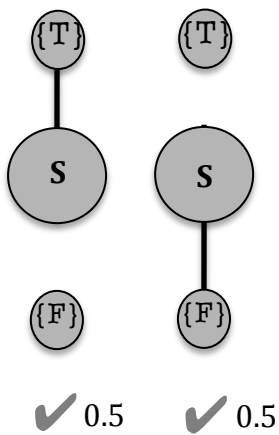


Fig.13

In this case, then, neither truth-values nor the assignment relation are degreed – rather, the accuracy of any assignment is.

The primitivist instead claims that it is indeterminate which of the assignments is accurate:

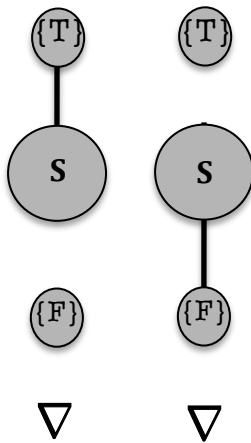


Fig.14

Nevertheless, by virtue of their *not* modifying the other aspects of the structure, we can be sure that the alternatives are exhausted by the two possibilities so represented. Assuming, as is plausible, that a possibility is actual just in case it is related to reality by the accuracy relation, we can thereby say that it is indeterminate whether each of these possibilities is actual. Assuming - *contra* the accuracy-glut view above - that it's determinate that exactly one alternative is actual, we can then further say that it is determinate that exactly one of the alternatives is actual, but it is indeterminate *which*. As such, determinate accuracy is non-prime.^{110, 111}

¹¹⁰ Since the glutty option made room for a non-adjunctive notion of accuracy, it's tempting to ask whether there might be a non-prime notion of accuracy too (rather than, as here, non-subjunctive *determinate* accuracy). This would allow the truth of '{T} or {F} is an accurate assignment', but deny that it entails either '{T} is an accurate assignment' or '{F} is an accurate assignment'. In effect, this would tell us that the *region* of alternatives is accurate, without any point in that region that being accurate. The analogue of this position seems to be something like Hudson's (2005) 'spanning' notion of location, where an object can be span-located in an extended region without being (in any sense – even partly) located at any subregion. Can an analogous idea be developed about accuracy: that the region *itself* is accurate? No. This is effectively to modify what can be a suitable relata of accuracy in the manner of a type-1 glutty view. (Indeed, Hudson makes sense of spanning by effectively expanding our conception of the possible subjects of location to include *extended* simples or 'spanners'). For suppose a region of is deemed 'accurate'. There must be at least one thing amongst the accurate things that is a possible assignment, on pain of the accurate assignment being impossible. But, by supposition, only the region itself is accurate, and hence the region itself is a genuine possible assignment. But, that's not what we were after *qua* type-3 view: we wanted to retain the simple view of the *possible* assignments, and to

The important point is that these options – the choice of three species and four flavours – are generic, in that they apply to *any* candidate arena, not just the putative indeterminacy of truth-value by truth-bearers. These options also apply to content-bearers and their content, or to agents and their states of knowledge, and so on. Consider the epistemicist idea of indeterminacy as a kind of unknowability. We could construe ‘unknowability’ either as the state of knowing a special kind of (glutty/gappy/degreed/primitively indeterminate) object of knowledge (type-1); by treating the knowability relation as non-functional, non-total, degreed or primitively indeterminate (type-2); or by claiming that there are multiple accurate knowability relations, or none, or that they’re accurate only to some degree, or that it’s primitively indeterminate which is accurate (type-3).

As such, we can refine the LSIA-model by amending the choices laid down in part (2) with the choices of character outlined here. Thus, a theory of the nature of indeterminacy consists in a choice of arena, species, flavour, source, and a type-identity claim identifying indeterminacy with the

modify *accuracy* instead. Instead, we’re effectively introducing an ‘extended possibility’, comprising what we originally thought were distinct possibilities into a possibility in its own right. That’s certainly a view – indeed, I think it corresponds to Akiba’s (2000, 2004) conception of metaphysical indeterminacy – but it’s a type 1, not a type-3 view.

¹¹¹ Paying attention to these differences also illustrates the error in Edgington’s (2010) allegation that there’s no difference between Sorensen’s (2001) view and that of McGee and McLaughlin (1995). On the contrary, Sorensen endorses a view of indeterminate truth as unknowable truth – where the alethic arena *isn’t* characterized by figure 14, but rather by the simple conception, and with an epistemic arena (with an alethic object of knowledge) characterized by a type-2 gap. As such, indeterminacy’s nature concerns an epistemic arena. By contrast, McGee and McLaughlin’s view deploys a conception of indeterminacy as primitively unsettled truth-value, where the relevant arena is wholly semantic, not epistemic. Of course, on the latter view, indeterminacy weakly manifests epistemically, but it doesn’t – unlike Sorensen, have an epistemic nature because its arena is wholly non-epistemic.

phenomenon so defined. Discussion of the extant literature with respect to the LSIA-model can be found in the appendix.

2.1.4 Higher-order indeterminacy

Before moving on, it is worth making a brief note on how this model might handle *higher-order* indeterminacy. Though we might formally represent higher-order indeterminacy in a possible-worlds style model, with a suitably restricted accessibility relation, there's no guarantee that there's any sensible *interpretation* of that formalism. Rarely, however, is it explicitly suggested what such an interpretation might look like – of a suitably non-transitive relation capable of underpinning it – beyond Williamson's (1994) suggestion that appeals to the non-transitivity of epistemic indiscriminability relation. Take a case of semantic indeterminacy, and consider how the properties of accessibility are governed by the meta-semantic facts. It's common amongst proponents of semantic indeterminacy to assume that the meta-semantic facts fix the clear cases and analytic truths and falsities, and thereby rule out sharpenings that violate them. Now, unless there are indeterminate analytic truths¹¹², then the relevant subjects of higher-order indeterminacy are the putatively 'clear cases'. It seems as though there's only two routes to HOI. First, either we claim a *single* arena exhibits *multiple* kinds of indeterminacy (e.g. that it's degreed *and* pluralist – cf. Smith), or else we may claim that the input node in the arena that determines accuracy – the meta-semantic facts and the function from those facts to meanings – might *themselves* be arena of indeterminacy. Call these *mixed-HOI* and *hierarchical-HOI* respectively.

¹¹² I see no reason why there couldn't be such, but they don't seem to be what's responsible for higher-order indeterminacy. Consider defining *batchelor** to be such that it only applies to males, but it's indeterminate whether it applies to only the unmarried. In that case, not only will unmarried men be borderline cases of *batchelor**, but it'll be indeterminate whether 'All *batchelors** are unmarried' is analytically true. (If all men are unmarried, it'll still be determinately true, else it'll be indeterminate whether it's true or false)

2.2 The varieties of Supervaluationism

The utility of the points above can be seen by how they illuminate some distinct varieties of supervaluationism that aren't always clearly distinguished.¹¹³ Using those distinctions, we can isolate five different kinds of supervaluationism. As we'll see, these involve quite different conceptions of 'precisifications' or 'sharpenings', and of their theoretical role, and they also fare quite differently in the face of some familiar objections. Thus, the choice between them is non-trivial. They serve to illustrate, then, that a choice of character of is not inconsequential.

We saw above that indeterminacy's nature could be unpacked by viewing it as consisting in the modification of the 'simple conception' of some 'arena' (i.e. a structure given by an interpretation of the quadruple $\langle L, S, I, A \rangle$). The relevant arenas to which the supervaluationist proposal is usually applied treat the loci as sentences and sub-sentential expressions. It will be useful below to distinguish *two* arenas in what follows:¹¹⁴

L: A language \mathcal{L} and syntax comprising: (i) terms (individual constants and individual variables), n -ary predicate letters, the quantifiers \exists and \forall , three syncategorematic sentential connectives ($\&$, \vee , and \neg), and punctuation; (ii) a defined set of well-formed formulae such that the concatenation of n -ary predicate letters with n terms, concatenation of a quantifier with a variable and open formula containing that variable, and formulae built out of those formulae and the sentential connectives are all well-formed.

¹¹³ Supervaluationism has been developed and defended by Mehlberg (1958), van Frassen (1966), Przelecki (1969), Lewis (1970), and Fine (1975). Its two most recent advocates Keefe (2000) and Varzi (2007). I won't try to exposit these in terms of the views hereby distinguished, not least because there's conflicting textual evidence in some cases for which view the theorist has in mind.

¹¹⁴ For ease of presentation, I'll characterise some of the components here as 'functions', rather than neutrally as relations.

S: A set of extensions and anti-extensions: a set of n -tuples of some non-empty domain M .

I: An set of 'interpretations' $\mathfrak{M}=\{M, \mathcal{J}^+, \mathcal{J}^-\}$: a set comprising M with a valuation functions $\mathcal{J}^+, \mathcal{J}^-$ that assign extensions as follows: (i) some object $\mathcal{J}^+(a) \in M$ to every individual constant a ; (ii) an n -tuple $\mathcal{J}^+(F)$ of $m \in M$ to every n -ary predicate F ; (iii) assigns M as the domain of \exists and \forall .¹¹⁵ Likewise \mathcal{J}^- . Correspondingly, we can view sentences as interpreted by a function to propositions/truth-conditional content.¹¹⁶

A: A relation from the meta-semantic facts into \mathbf{I} , picking out the *intended* model \mathfrak{M}^* .¹¹⁷

L: A language and syntax (as above).

S: An algebra comprising: (i) a set of ordered truth values T ; (ii) three operators defined on this set, including two binary operators ' \sqcap ', ' \sqcup ' (taking us to the infimum and supremum of their inputs respectively), and a unary operator ' $'$ ' (which takes us to the complement of its input).

I: An 'assignment' τ : a valuation function which assigns a truth-value $t \in T$ to every declarative sentence.

A: A function from the relevant non-semantic facts into \mathbf{I} , picking out the *intended* truth-value assignment.

Classical semantics conceives of these structures as according to The Simple Conception, such that: (a) anti-extensions are determined trivially

¹¹⁵ Strictly, to fully interpret the language we should include a variable assignment function in \mathfrak{M} . Since its invariant over models, I'll omit it for simplicity.

¹¹⁶ I'm assuming that sentences are coarsely individuated syntactically, and that they *express* propositions - which are more finely individuated - relative to a context.

¹¹⁷ The meta-semantic facts being those facts responsible for the determination of the semantic properties of \mathcal{L} (patterns of assertion, dispositions to assert, intrinsic eligibility, conventions etc.)

as the complement of the corresponding extension (and thus possible contents are pairs of exclusive and exhaustive truth and falsity conditions), and there is a *boolean* algebra of truth-values; (b) interpretations map exactly one extension to a constant/predicate (and, thus, exactly one content to a sentence), and assignments exactly one truth-value¹¹⁸; and (c) selection of exactly one of the interpretations/assignments is *intended*.

Any account of indeterminacy which treats sentences as loci, whether of indeterminate truth or content, must modify the simple conception by adopting one of the characters outlined before. Supervaluationism's modification is guided by the motivating ambition to minimise the revision of classical logical theorems (in particular, LEM), and to respect penumbral connections.¹¹⁹ Its novel theoretical device – precisifications – are a formal device encoding the idea that vague terms 'can be made precise' in various ways, and is wielded to achieve the motivating ambitions.¹²⁰ All varieties of supervaluationism share the following formalism:

¹¹⁸ Moreover, the content of logically complex statements is determined compositionally, such that the sentential connectives effectively behave as content-functions on content of atomics. Similarly, the truth-values of complex sentences are assigned recursively by associating the sentential connectives with the algebraic operators such that '&'= \sqcap , ' \vee '= \sqcup , and ' \neg '= $*$. (An alternative, but common, expression of this employs meta-semantic connectives (e.g. that $\mathcal{V}(pvq)=1$ iff $\mathcal{V}(p)=1$ or $\mathcal{V}(q)=1$). I'll stick with the algebraic construal because I think it will be more useful for later discussion about the meaning of connectives, and whether some semantics 'change the subject' given their explications of the meaning of connectives.) ' $\exists xP$ ' and ' $\forall xP$ ' are treated as generalised conjunction and disjunction respectively, by treating them as the infimum and supremum of values assigned by all alternative \mathfrak{M}' exactly like \mathfrak{M} except that they assign a constant in place of the relevant variable, with each \mathfrak{M}' assigning a different object $J(a)\in M$ to that constant, for all members of M .

¹¹⁹ Penumbral constraints can be glossed meta-linguistically, or as certain sacrosanct object-language sentences (e.g. Tappenden's (1993) 'pre-analytic' sentences).

¹²⁰ I'll assume throughout that precisifications are classical. Though not essential – the supervaluationist formalism could be plugged into Kleene, Lukasiewicz, or Intuitionist models – it is normally assumed because of the motivating ambition: classical theorems are assumed to be a species of penumbral truths. I'll also restrict my attention to complete precisifications, ignoring the partial ones also discussed in Fine (1975). This is not uncontroversial though. We'll discuss below

A *supervaluationist model* \mathfrak{M}^{sv} is a tuple $\langle \mathcal{P}, \mathcal{R}, \mathcal{J} \rangle$ containing a frame – a set of precisifications \mathcal{P} and an accessibility relation \mathcal{R} on \mathcal{P} – and a supervaluation function \mathcal{J} . The crucial features are these:

(a) Precisifications $\mathcal{p} \in \mathcal{P}$ are classical models: a pair $\langle \mathcal{D}_{\mathcal{p}}, \mathcal{V}_{\mathcal{p}} \rangle$, comprising a domain \mathcal{D} of \mathcal{p} (a set of individuals) and an interpretation-function such that:

- For any constant term α : $\mathcal{V}_{\mathcal{p}}(\alpha) \in \mathcal{D}_s$
- For any n-ary predicate F : $\mathcal{V}_{\mathcal{p}}(F) \subseteq \mathcal{D}_s$

These give the \mathcal{p} -denotation of a term, and the \mathcal{p} -extension of a predicate.

(b) Indeterminacy is marked by variation between precisifications. The bits of language that can exhibit indeterminacy, therefore, are marked by the truth of the following (meta-linguistic) claims about a supervaluationist model:¹²¹

- $\exists \alpha, \exists \mathcal{p}, \exists \mathcal{p}', \mathcal{V}_{\mathcal{p}}(\alpha) \neq \mathcal{V}_{\mathcal{p}'}(\alpha)$ - this is true just in case there is a term in the object-language which is indeterminate in reference.
- $\exists F, \exists \mathcal{p}, \exists \mathcal{p}', \mathcal{V}_{\mathcal{p}}(F) \neq \mathcal{V}_{\mathcal{p}'}(F)$ - this is true just in case there is a predicate in the object-language which has an indeterminate extension.
- $\exists \alpha, \exists \mathcal{p}, \exists \mathcal{p}', \mathcal{V}_{\mathcal{p}}(=) \neq \mathcal{V}_{\mathcal{p}'}(=)$ - this is true just in case there is an object-language identity claim which is indeterminate.¹²²

some objections to the idea that complete precisifications are admissible. Indeed, Shapiro is moved by a desire to treat tolerance principles as penumbral truths to reject the classicality of precisifications.

¹²¹ There is an assumption in force here of trans-sharpening identity: that one and the same individual might occupy the domains of distinct precisifications. Alternatively, this could be dropped and handled counterpart-theoretically, with the interesting result of introducing similarity-based context-sensitivity into judgements of (in)determinacy. We'll discuss this below.

¹²² Assuming that '=' is an object-language dyadic predicate, such that $\mathcal{V}_s(=) = \{ \langle x, y \rangle : x, y \in \mathcal{D}_s \}$, this is just a special case of the prior claim.

- $\exists p, \exists p', \mathcal{D}_p \neq \mathcal{D}_{p'}$ - this is true just in case there is an object-language (unrestricted) quantifier with an indeterminate domain.

(c) A variable assignment is a function v such that: for each variable x , $v(x) \in \mathcal{D}_p$. Since the variable assignment is invariant over precisifications, we can define a composite interpretation function $\mathcal{V}_{p,v}$ assigning a denotation to all terms. Using this, a semantic relation \Vdash ('true under') is defined recursively, such that:

- $v, p \Vdash F^n \alpha_1 \dots \alpha_n \Leftrightarrow \langle \mathcal{V}_{p,v}(\alpha_1), \dots, \mathcal{V}_{p,v}(\alpha_n) \rangle \in \mathcal{V}_p(F)$
- $v, p \Vdash \neg \varphi \Leftrightarrow v, p \nVdash \varphi$
- $v, p \Vdash \varphi \& \psi \Leftrightarrow v, p \vDash \varphi$ and $v, p \Vdash \psi$
- $v, p \Vdash \varphi \vee \psi \Leftrightarrow v, p \vDash \varphi$ or $v, p \Vdash \psi$
- $v, p \Vdash \forall x \varphi \Leftrightarrow$ For all v' that differs from v at most over x , $v', p \Vdash \varphi$
- $v, p \vDash \Delta \varphi \Leftrightarrow$ For all p' such that $p \mathcal{R} p'$, $v, p' \vDash \varphi$.¹²³
- (Truth-on-a-precisification) $p \Vdash \varphi \Leftrightarrow$ For all v , $v, p \Vdash \varphi$

Correspondingly, we can use ' \Vdash ' to introduce a (bivalent) precisification-relative assignment-function $\mathcal{J}_{p,v}$, which assigns truth-at-a-precisification values.

(d) \mathcal{J} is a valuation-function assigning 'super-truth values' such that:

- φ is supertrue ($\mathbb{T}(\varphi)$) in $\mathfrak{M}^{\text{sval}} \Leftrightarrow$ For all $p \in \mathcal{P}$, $p \Vdash \varphi$
- φ is superfalse ($\mathbb{F}(\varphi)$) in $\mathfrak{M}^{\text{sval}} \Leftrightarrow$ For all $p \in \mathcal{P}$, $p \nVdash \varphi$

This is the bare minimum of agreement between varieties of supervaluationism.^{124, 125} Crucially, the formalism says nothing about how

¹²³ \mathcal{R} governs which precisifications are *admissible* from a precisification, and is what is exploited for the purposes of modelling higher-order indeterminacy. Plausible conditions for admissibility include consistency with penumbral truths, and preservation of determinate truth-values. For full discussion, including of the conditions of 'stability, fidelity, completeability, and resolution', see Fine (1975, 268-79) and Keefe (2000, 7.2).

any of the defined notions correspond to our ordinary notions of content and truth – that’s a matter of disagreement amongst varieties of supervaluationism. As such, we need to say what this formalism has to do with the LSIA-model: how it affords us the means to amend the simple conception.

As I said above, I want to distinguish five varieties of ‘supervaluationism’:

Type-1	Type-2	Type-3a	Type-3b	Hybrid
Interpretations of $\mathcal{L} = \mathfrak{M}^{\text{sval}}$	Interpretations of $\mathcal{L} = \mathfrak{M}^{\text{sval}}$	Interpretations of $\mathcal{L} = \mathcal{P}$	Interpretations of $\mathcal{L} = \mathcal{P}$	Interpretations of $\mathcal{L} = \mathcal{P}$
\mathcal{L} ’s valuation function = \mathcal{J}	\mathcal{L} ’s valuation function = \mathcal{J}	\mathcal{L} ’s valuation function = $\mathcal{J}_{p,v}$	\mathcal{L} ’s valuation function = $\mathcal{J}_{p,v}$	\mathcal{L} ’s valuation function = \mathcal{J}
Indeterminacy is an attribute of content.	Indeterminacy is an attribute of interpretation.	Indeterminacy is an attribute of content-bearers.	Indeterminacy is an attribute of content-bearers.	Indeterminacy is an attribute of content-bearers.

On the type-1 view, \mathcal{L} has a unique interpretation and assignment, $\mathfrak{M}^{\text{sval}}$. It thereby identifies truth *simpliciter* with supertruth. It treats the upshot of $\mathfrak{M}^{\text{sval}}$ to be that indeterminate sentences have gappy truth-values and gappy content – as such, it modifies \mathcal{S} by supplementing it with (a) a new kind of truth-value; (b) a set of ‘ ∇ -extensions’, in addition to the extensions and anti-extensions.¹²⁶ Strictly, then, type-1 views take the description of

¹²⁴ Actually, as we’ll discuss, the formalism doesn’t even distinguish *supervaluationism* from its *subvaluationist* cousin. I’m artificially restricting focus to the former, for now, just for sake of illustration.

¹²⁵ Alternatively, a broader family of formalisms retains the truth-value assignment components, but replaces the interpretational component. Precifications are thereby reconstrued, not as sharpenings of the language, but rather as histories (Thomason (1970), world-segments (Akiba (2004)) or possible worlds (Barnes and Williams (2010))).

¹²⁶ Thinking of classical propositions as functions from worlds into $\{0,1\}$, we can think of a gappy proposition as a function from worlds into $\{0,\nabla,1\}$.

$\mathfrak{M}^{\text{sval}}$ above to be slightly impoverished, by including the following further conditions:

- (a) \mathcal{I} is a (total) function on sentences φ satisfying the further condition that: $\mathbb{I}(\varphi) \text{ in } \mathfrak{M}^{\text{sval}} \Leftrightarrow \text{For some } p, p' \in \mathcal{P}, p \Vdash \varphi \text{ and } p \nVdash \varphi$
- (b) $\mathfrak{M}^{\text{sval}}$ also comprises a (total) *superinterpretation* function \mathcal{V} assigning *non-precisification relative* extensions. This assigns *three* subsets to each term or predicate: an extension, anti-extension, and ∇ -extension, mirroring the precisification-relative interpretation functions in the obvious way. Such mirroring secures what is distinctive of this view against non-supervaluationist third-value views: as with the failure of truth-functionality, the extensions of logically complex statements are not determined compositionally.

Thus, as per all type-1 views, this maintains that there is a unique intended total functional interpretation/assignment, but incorporates indeterminacy by supplementing the range of that function to include a third truth-value and gappy content.

On the type-2 view, \mathcal{L} has a unique interpretation and assignment, $\mathfrak{M}^{\text{sval}}$. It thereby identifies truth *simpliciter* with supertruth. It treats the upshot of $\mathfrak{M}^{\text{sval}}$ to be that indeterminate sentences have truth-value and content gaps – as such, it modifies I by claiming that the interpretation and assignment functions are *non-total*. Unlike the type-1 view, it treats the description of \mathcal{I} above to be complete, without the need for a further clause governing a third-value. It does, however, also introduce a non-sharpening relative superinterpretation function \mathcal{V} , but again deems it non-total: an object is mapped to an extension/anti-extension of a term/predicate by \mathcal{V} just in case it is so mapped by every precisification, meaning some objects are

mapped to neither.^{127,128} Again, the distinctively supervenient aspect of this is the ensuing failure of truth-functionality and compositionality. Thus, as per all type-1 views, this maintains that there is a unique functional interpretation/assignment with a classical range, but denies that the interpretation is total.

For all that type-1 and type-2 varieties might respect the supervenient ambition to save penumbral truths, they nevertheless neglect *another* common motivating idea behind supervenientism: the egalitarian thesis that there are multiple interpretations that are each, in some sense, *as good as one another*. The egalitarian thesis is clearly stronger than the prior intuition that there are borderline cases - that can be handled by either of the preceding accounts - and seems to me more like a *diagnosis* of the borderline-case intuition, rather than data in its own right. Regardless of that issue, it may be that egalitarianism provides a better diagnosis than that offered by either of the preceding views, so is worth investigating. Type-3 views aim to respect both penumbrality *and* egalitarianism.

There are two kinds of type-3 supervenient views in the literature: gluttony and primitivity.¹²⁹ On these accounts, the \mathcal{L} 's possible interpretations are identified with the precisifications \mathcal{P} , and its possible assignments with the $\mathcal{J}_{p,v}$, thus identifying truth *simpliciter* with truth-at-a-precisification.¹³⁰

¹²⁷ Construing an interpretation function, as I have before, as a function from terms/predicates to n-tuples, this doesn't yield a failure of totality. As such, it's more perspicuous to view the interpretation function as a function from *objects* to *term/predicate-n-tuple pairs*. I'll stick with the former throughout just because of its familiarity.

¹²⁸ Again, propositions in this case can be thought of as a non-total function from worlds into $\{0,1\}$.

¹²⁹ Braun and Sider's (2007) nihilist view seems like the type-3 gap view in the vicinity. So far as I know, nobody has advocated a type-3 degree view. For what it's worth, I find Smith's (2008) defence of type-1 degrees much more convincing as applied to type-3 degreehood.

¹³⁰ What Williamson calls 'local truth', and thus bivalence. It might be objected that anybody who countenances non-epistemic (especially primitive)

Thus, since the precisifications (we're assuming) are classical models, type-3 views modify neither *S* nor *I*, instead modifying *A*: what counts as the *intended* interpretation/assignment.

Type-3a countenances type-3 *gluts*: it claims that *multiple* precisifications are intended interpretations/assignments. As such, sentences have truth-value and content gluts.¹³¹ On such accounts, if there is a precisification on which a sentence is true, and a precisification on which it is false, the sentence has *both* of those truth-values, but avoids contradiction because those truth-values are had relative to different interpretations/precisifications.¹³² Type-3b countenances type-3 unsettledness: it claims that it's primitively indeterminacy which of the precisifications is the intended interpretation assignment. As such, it's

indeterminacy of truth-value has no good reason to believe in bivalence, and thus no good reason to adopt such a view. There's no obstacle here: the non-epistemicist can appeal, as the epistemicist does, to the success of classical logic to claim knowledge of LEM. Coupled with the claim that they know the Tarski biconditionals, by alleging their analyticity, they can thereby claim to know the truth of bivalence. Type-3 primitivist views countenancing non-epistemicist indeterminate truth with bivalence include Barnett (2009) and McGee and McLaughlin (1995).

¹³¹ This is what Smith (2008) calls 'plurivaluationism', and corresponds best to the idea associated with Fine that vagueness is a kind of ambiguity. I assume that was intended as a mere gloss, since vagueness (and indeterminacy generally) appear quite distinct from ambiguity. Distinguishing them is simple enough once we remember that we're here concerned with the interpretation(s) of a sentence *in a context of utterance* – for, plausibly, (successful) utterances of ambiguous sentences will disambiguate, thereby eliminating the glut. Not so, on this account, indeterminacy. (Moreover, that being said, it seems more plausible to me to construe ambiguity as a type-2 content glut, rather than – as is here being entertained – a type 3 glut.) Views in the vicinity are advocated by Eklund (2010) – who explicitly distinguishes *type-3* gaps in the semantic case -, Dorr (2003) and Rayo (2010).

¹³² This could equally well be classified as a species of *subvaluationism*, especially if one were to request a logic of *sentences* (rather than propositions), which must – in this case – presumably be weakly paraconsistent. Nevertheless, extant defences of subvaluationism seem to me to more closely align to type-1/2 views or the sibling of the hybrid view to be described shortly.

primitively indeterminate which truth-value or content is had by an indeterminate sentence.¹³³

Finally, we meet the hybrid views. Heretofore we've assumed that the interpretation function and assignment function march in step – that the indeterminacy of one is matched by the other. The motivation for this is a linkage principle: that sentences have truth-values *relative to an interpretation*. Hybrid views deny this principle.^{134,135} Once we abandon the linkage principle, we've several options for what to say about how truth assignments behave when a sentence S has type-3 indeterminate content. Where $|S|$ is the sentence's truth-value, and $|p| \in \mathcal{P}$ is its truth-on-a-precisification values:

(High) $|S|$ is the supremum of the truth-values of its $|p| \in \mathcal{P}$.

(Low) $|S|$ is the infimum of the truth-values of its $|p| \in \mathcal{P}$.

(Gap) $|S|$ is the intersection of the truth-values of its $|p| \in \mathcal{P}$.

(Glut) $|S|$ is the union of the truth-values of its $|p| \in \mathcal{P}$.

(Degree) $|S|$ is the average truth-value of its $|p| \in \mathcal{P}$.¹³⁶

(Arbitrary) $|S|$ is an arbitrary truth-value from amongst its $|p| \in \mathcal{P}$.

(Indeterminate) $|S|$ is primitively indeterminate amongst its $|p| \in \mathcal{P}$.

¹³³ This seems like the view of McGee and McLaughlin (1994), at least for one disambiguation of the natural language truth-predicate. The LSIA-structure makes it very clear exactly how this view is theoretically distinct from Williamson's epistemicism: they diagnose indeterminacy as afflicting different arenas.

¹³⁴ They don't, thereby, claim that *uninterpreted* sentences have truth-values of course – they're had relative to, say, a set of multiple intended interpretations. The exception is type-3 content gap views – in that case, a sentence may have a truth-value even though it lacks any intended interpretations. This still doesn't seem obviously nuts to me, insofar as we might still claim that they're had relative to nearby *counterfactual* intended interpretations.

¹³⁵ There is a parsimony cost to this of course: we now have a notion of sentential truth that's distinct from propositional truth, so incurring the explanatory burden of explaining why they behave well in cases of determinacy, complicating our accounts of norms, and so on. The hope is, of course, that such costs are worth it.

¹³⁶ Assuming propositional truth=1 and falsity=0.

The hybrid view closest to supervenience, it seems to me, pairs type-3 content gluts with (Gap): a sentence expresses *multiple* contents, and has a truth-value just in case those contents agree in truth-value (the intersection being empty otherwise).¹³⁷

Clearly, which of these options one chooses will have significant impacts in other areas. Most obvious is their impact on consequence.¹³⁸ After all, Γ implies Σ the members of Γ and Σ cannot be interpreted to make each of the former true and all of the latter false – so which entity we’re construing as an interpretation, and how that interpretation suffers indeterminacy, will impact upon consequence. Also, if not also by the impact on consequence, the ensuing conceptions of truth will have a direct impact on the cognitive attitudes its appropriate to have in cases of indeterminacy given a conception of truth-norms. As such, these choices have widespread ramifications.

¹³⁷ How do we choose amongst these unorthodox linking principles? (High) and (Low) seem contrary to the egalitarian ambitions of type-3 supervenience, and maybe so is (Arbitrary) – or maybe not, it is arbitrary after all. (Degree) will screw up once we get into the territory of infinitely many precisifications – which needn’t be that far away once we consider indeterminate predicates in the vicinity of continuous quantities, such as ‘tall’ – and so will require the ideological complication of supplementation by some measure or other. Plausibly, all will have to be implemented to the assignment function globally, rather than locally to individual sentences, if it’s to respect penumbral constraints. Given that, at least all of the last five, however, seem to do a decent job of impeding our ability to believe or assert that S is true or false.

¹³⁸ It might thereby be suggested that we seek an account of consequence *via* an account of what we consider the interpretations to be – a semantics/meta-semantics first approach. This isn’t mandatory: we might instead follow the conservative approach of Williamson and take the past success of a classical consequence relation to guide our semantic theorizing. Alternatively, we might follow Williams (2011), and look to consequence’s attitude-norming role.

2.3 From semantic to metaphysical indeterminacy

Before moving on to discuss metaphysical indeterminacy, I want to briefly look at two arguments which purport to establish metaphysical indeterminacy by piggy-backing on claims about semantic indeterminacy. Tackling these arguments emphasises the importance of some of the preceding distinctions.

2.3.1 Merricks' argument

Merricks (2001) purports to establish that theories of semantic vagueness collapse into either metaphysical or epistemic vagueness. More carefully, he aims to establish that semantic theories of vagueness fail in their ambitions to identify a genuinely alternative *source* of vagueness that is neither epistemic nor metaphysical. Coupled with the widespread incredulity many feel in response to epistemic theories, such an argument could be very useful in establishing metaphysical indeterminacy. The argument proceeds as follows:

- 1) For some vague predicate 'F', there is a possible name 'a' such that the sentence 'a is F' is indeterminate. (e.g. For some individual Harry, who is a borderline case of baldness, 'Harry is bald' is indeterminate).
- 2) If the sentence 'a is F' is indeterminate, then the sentence "'F' describes a' is indeterminate (Thus, "'Bald' describes Harry' is indeterminate). Likewise for other semantic notions: it is indeterminate whether "'F' applies to a', 'a is in the extension of 'F'", "'F' refers to a property had by a', etc.
- 3) Either "'F' describes a' expresses a unique proposition, many propositions, or no proposition.
 - 3a) If a unique proposition, the indeterminacy can only be due to either: a) *metaphysical indeterminacy* in whether **describing** relates

'F' and a; OR b) our *ignorance* of whether **describing** relates 'F' and a.¹³⁹

3b) If many propositions, there must be a sub-sentential expression responsible.

3bi) "F" is not to blame, because although 'F' is vague (by hypothesis), it is not *used* in "F' describes a', but only *mentioned*, and it is not vague which word is being referred to.¹⁴⁰

bii) 'a' is not to blame, because even if it's vague, it's plausibly not responsible for 'F' being vague

3biii) Thus, 'describes' must be responsible.

3c) The responsible expression must have many denotations.

3d) Therefore, 'describes' must express many relations R1, R2....Rn, such that 'F' bears R1 to a, but 'F' does not bear R2 to a etc.

3e) If 'describes' expresses many relations, then it is not semantic vagueness, because:

3ei) It exhibits no semantic indecision.

3eii) That the Rn facts are determinate, but also quasi-semantic facts, betrays the idea that semantic vagueness is due to semantic indecision.

¹³⁹ Likewise with regard to whether *a* has the property of **being described by 'F'**, or 'F' has the property of **describing a**.

¹⁴⁰ Actually, Merricks concedes that it may be vague, but that were it so, "F" would thereby express *many homonymous words*, each of would (determinately) describe or (determinately) not describe Harry, rendering us *merely* ignorant of those facts, and the account thus – so he claims – epistemic.)

3eiii) It is mere ambiguity.

3eiv) The ensuing vagueness is merely epistemic.

3f) If no proposition, parallel reasoning applies.

4) Thus, 'F' describes a' is not semantically vagueness ($\neg(S-b)$).

5) The variety of indeterminacy had by a meta-semantic vagueness is identical to that had by the corresponding object-language sentence.

C) Thus, no sentence 'a is F' is semantically vague ($\neg(S-b)$).

Many of these premises seem questionable. (1), (3b), and (3c) seem to me to be pretty plausible. What of the remainder?¹⁴¹

To begin, let's look at (3a), and the assumption of a unique proposition. First, his claim that a unique proposition must be diagnosed as being in virtue of *either* metaphysical *or* epistemic vagueness relies upon the assumption that we be inflationary about the requisite semantic relations. However, that is plausibly deniable. We might, for instance claim that 'describing' and its ilk do *not* stand for relations in an ontologically inflationary sense. The semantics of 'describing' could be given in standard set-theoretic terms, but that needn't correspond to any sparse relation. As such, there would be no relation to be metaphysically vague nor for us to be ignorant of. The vagueness, instead, would manifest in the unique proposition denoted being a set of sets of worlds: a set of worlds at which it

¹⁴¹ It appears to me that the semantic ascent at (2) is a mere illustrative device, and completely inessential to the argument. That is, the argument trades on showing that the vagueness of the meta-linguistic sentence, however construed semantically (as expressing one, many, or no propositions), is not characterisable as semantic because neither of those options is so characterisable. As such, that point can be made about the object-language statement 'a is F' *directly* – he can address whether it expresses one, many or no propositions, and claim that none of those suffice for semantic indeterminacy. As such, premises (2), and (5) can be bypassed.

is true, a set at which it is false, and a set at which it is neither. Likewise, 'describes' would denote a set in which the union of its extension and anti-extension are a proper-subset. (For instance, 'describes' might denote something like the following: $\{\{ \langle \text{'Bald'}, \text{Larry David} \rangle \dots \} \{ \langle \text{'Tall'}, \text{Danny Devito} \rangle \dots \} \{ \langle \text{'Bald'}, \text{Harry} \rangle \dots \}$). Moreover, that our terms (including our semantic terms) denote these entities would, as per the semantic theory, be attributable to our semantic indecision regarding whether the borderline cases fall in the extension or anti-extension. Denying that any of our semantically vague expressions refer to a sparse property, then, will undermine (3a).

Second, note that even accepting that we be inflationary about, for example, semantic relations, only secures the claim that linguistic vagueness *manifests* in metaphysical or epistemic vagueness – not that the vagueness has its source in non-semantic facts. Indeed, the hypothesised metaphysical/epistemic indeterminacy may have its source in semantic indeterminacy.¹⁴² Perhaps it would be more charitable, then, to read Merricks as discussing the *nature* of vagueness – that what vagueness *is* is the expression of a unique proposition characterising a metaphysically vague state of affairs, or of which we're in principle ignorant. However, his claims would fall short of establishing this, for similar reasons to the above: his semanticist opponent can claim that the *nature* of vagueness is to express a unique 'gappy proposition' of the kind described in the last paragraph. Merricks does nothing to undermine such a proposal.

Problems also beset the claims about the expression of many propositions (3ei-iv). I'll run through his reasons for such not being semantic:

(i) Why does he claim that it exhibits no semantic indecision? It seems as

¹⁴² Moreover, even if it did establish that it is grounded in non-semantic metaphysical facts, it's a further step to the claim that it is grounded in metaphysical *vagueness*.

though there exists a plurality of propositions precisely *because* of semantic indecision: the fact that we've failed to decide which the Rn to express by 'describes' seems directly responsible for there being a plurality of propositions expressed. The most charitable reading I can make of (i) is thus either that it collapses into (ii), or that Merricks has slipped into thinking of the nature of question from the source question. Now it *may* be plausible to claim that the existence of a plurality *per se* falls short of semantic vagueness *if* the nature of semantic vagueness *is* semantic indecision (more on this below). But that is irrelevant, for our concern here is with it having a semantic *source*.

(ii) What then of (ii)? It squarely has the source question in focus: it alleges that the determinacy of the Rn facts is incompatible with the claim that the plurality holds in virtue of semantic indecision. This is misguided. The proponent of the claim that vagueness has a semantic source - with semantic indecision construed as the ground, for example - claims that our semantic indecision does not fix a unique extension for natural language terms, and thus (directly, or by inheritance) for some meta-semantic terms like 'describes'. This does not proscribe that there are no Rn facts, nor that any term 'Rn' cannot precisely denote them. It does *not* claim that there are no determinate facts about semantic-like relations in general, only that no such relation can uniquely characterise vague language. The motivating concern behind (ii) seems to be 'if we can't decide on a unique extension for 'describes', how on earth could we do it for the more fine grained 'Rn'!'. But the 'Rn' are just theoretical terms stipulated to denote precise relations - they're not subject to our indecision because we do not use them other than stipulatively, and they do not inherit object-language vagueness because they are not purporting (unlike 'describes' etc.) to characterise our vague semantic relations - but rather, relations *between which* we're indecisive.

(iii) The 'mere ambiguity' objection is interesting because, again, it seemingly marks a shift to a concern with 'nature of' questions rather than

‘source’ questions. The thought seems to be that if you think that vagueness holds in virtue of semantic indecision, and that indecision results in propositions expressing multiple propositions, then you ought to think that vagueness *is* the expression of multiple propositions. But, the argument goes, that’s *mere* ambiguity, not vagueness.¹⁴³ Even so, Merrick’s thought appears to be, this isn’t semantic indeterminacy. Two things are worth commenting on this. First, it isn’t obvious what is meant to be wrong with the view of vagueness *as* multiplicity, such as type 3 supervenience. To be sure, not all cases of ambiguity will give rise to the core features of vagueness, but that’s compatible with thinking of vagueness as a *species* of ambiguity.¹⁴⁴ Alleging *mereness* thus seems plain question begging. Second, and more importantly, this doesn’t establish that the ‘ambiguity’ isn’t sourced in semantic indecision.

(iv) The allegation that the account is merely epistemic can be disambiguated to either nature or source claim. As a source claim, it seems plainly false – there are many propositions expressed (according to the view) *because* of semantic indecision. He says that “If we knew all the facts of the matter about each and every semantic relation relating ‘bald’ and Harry, there would be no feelings of indecision.” I assume by ‘feelings of indecision’ he means any sort of uncertainty or confusion about what to judge. This is false: even if we knew all the Rn facts, we might still be

¹⁴³ Set aside that the allegation that this is really ambiguity *proper* – that’s implausible, assuming that context tends to disambiguate, whereas the multiplicity of contents in the cases under discussion is not so eliminated.

¹⁴⁴ Merricks does offer an argument for ambiguities unsuitability. The claim seems to be that ambiguity does not give rise to borderline cases, a core feature of vagueness. He invites us to consider the name ‘one-or-two’ which is ambiguous between one or two, and then the sentence ‘one-or-two plus one equals two’. He denies that this sentence is vague, but merely ambiguous, because there’s ‘nothing remotely resembling a “borderline” case.’ This look plain deniable by the proponent of this view: they can claim that ‘one-or-two’ is a borderline case of ‘equalling 2 when summed with 1. This is disanalogous with stock examples only in that the borderlinehood derives from vagueness in the name of the subject term, rather than the predicate.

ignorant of where that leaves the truth-value of the sentence involving 'describes'. That aside, the proponent of the view that vagueness has a semantic source doesn't think vagueness occurs in virtue of 'feelings of indecision', but in virtue of semantic indecision – so even if our ignorance of Rn facts were to dissipate, this wouldn't undermine the vagueness on their view. Indeed, for the line of argument suggested in the quote to have any force we must *presuppose* that vagueness has an epistemic source, which is of course dialectically inappropriate. Could he, then, be claiming that it has an epistemic nature: that the 'vagueness is ambiguity' view is a species of epistemicism? That seems ridiculous: the view is that the vagueness *is* the expression of multiple propositions – there's no epistemic relations in that structure to justify deeming it a kind of epistemicism. Sure, we are plausibly ignorant of the Rn facts, but that seems irrelevant: as I said above, we *might* remain ignorant of how to evaluate our sentence involving 'describes' even if we knew the Rn facts, but that's just indeterminacy weakly-manifesting epistemically.

Similar considerations apply to the view that no proposition is expressed – he has offered no reason to undermine the view that such might hold in virtue of semantic facts, and so qualify as semantically sourced. Likewise for the 'nature of' question.

Further problems, however attend (3): his assumption that the only options here are for our vague sentence to express either that no proposition, a unique proposition, or multiple propositions. An obvious alternative is completely overlooked: that it be indeterminate which proposition is expressed. Where *this* indeterminacy is construed epistemically, then such a proposal collapses into the unique proposition view. However, it might be interpreted semantically or metaphysically. The metaphysical case won't help avoid Merricks's conclusion, of course, that there are really only two varieties of vagueness: metaphysical and epistemic. The semantic construal of the vagueness will, however, point to a further way to avoid

Merricks's conclusion. On this view, it will be semantically vague which proposition "F' describes a' expresses. This will require, of course, that any sentence of the form 'S expressed proposition P' be semantically vague. Likewise for subsentential expressions, the sentence "Bald' refers to baldness_n" (where 'baldness_n' denotes some candidate precise denotation for bald) will - if (as seems plausible) indeterminate¹⁴⁵ - require 'refers' to be semantically indeterminate. A peculiarity arises from this view, of course, in the form of sentences like "'Refers' refers to Reference_n". But odd as that is, it is perfectly consistent: there will be a plurality of candidate reference relations R₁, R₂...R_n, such that it will be semantically vague which of them is referred to by 'Reference'. Each R_n will be a set of ordered pairs <'t', e> whose members are a term 't', and a denotation of 't' (which may itself be a term). Semantic vagueness of 'Reference' could thus to be understood as, for example, indecision over which set of ordered pairs is denoted by 'reference'.¹⁴⁶ (In that case, of course, any candidate R_n will plausibly pair 'reference' with R_n itself - i.e., $\forall R_n, \langle \text{'Reference'}, R_n \rangle \in R_n$.)¹⁴⁷

In summary then, Merricks's argument fails to persuade. Moreover, it emphasises the need to be vigilant about which of nature, source, or manifestation is at issue.

2.3.2 Caie's argument

The second argument to try and establish meta-semantic metaphysical indeterminacy comes from Caie (2014). Caie claims that the meta-semantic considerations that typically are used to motivate supervenience (*qua*

¹⁴⁵ Note, "'Bald' refers to bald.", and similarly "S expresses a proposition", may themselves be determinately true.

¹⁴⁶ For a proponent of this sort of view see Lopez de Sa (2013).

¹⁴⁷ Lopez de Sa rightly retorts to Salmon's charge of a vicious regress proceeding up the meta-semantic hierarchy, that the order of explanation here should proceed from the top down (he draws an analogy with hierarchies formed by iterations of the truth predicate).

theory of *semantic* indeterminacy) fail to sustain semantic indeterminacy, and so are better served by embracing *metaphysical* indeterminacy in what the semantic content of natural language is. These motivations rule out epistemicism, so the argument is effectively one by elimination. I'll argue that his claims against supervenience are unpersuasive.

The motivating considerations in question are:

Egalitarianism: (a) The meta-semantic facts fail to determine a unique intended classical interpretation; (b) multiple classical interpretations are equally as good as one another.^{148,149}

Contentfulness: The language doesn't lack an intended interpretation.¹⁵⁰

Either of these claims have their dissenters, of course, but their *prima facie* plausibility is, says Caie, what partly motivates supervenience. The thought is that they try to accommodate egalitarianism by agreeing that the meta-semantic facts fail to single out a unique classical interpretation, whilst respecting contentfulness by treating the language as interpreted by a supervenience model that uses those classical models as precisifications. (The target then, in terms of the above, is type 1/2 supervenience. He also attacks type 3 supervenience in turn, which we'll get to shortly).

¹⁴⁸ Caie formulates his discussion by talking of 'proto-classical' interpretations here, which are silent on the interpretation of Boolean connectives. I'm ignoring this for simplicity of presentation, since it has no relevance to my criticisms. Indeed, he develops the argument in a great deal of detail, but I don't think much of it is essential to grasping the basic argument.

¹⁴⁹ His explicit formulation of Egalitarianism only mentions (a), but it seems as though (b) is operative throughout his argument, and is suggested by the name.

¹⁵⁰ This is different from Caie's gloss of contentfulness as there being 'a correct assignment', at least if that means 'there is a unique intended interpretation'. That is quite strong, especially given his ensuing discussion of plurivaluationism, which *denies* uniqueness, hence my modification.

Caie develops his argument within the framework of a Lewisian meta-semantic, though plausibly this is merely illustrative – other meta-semantic accounts could be used to pursue his argument. The basic idea is that the relevant meta-semantic facts involve (a) dispositions of truthfulness and trust amongst members of the linguistic community¹⁵¹, and (b) facts about the intrinsic eligibility of candidate interpretations. Thus, according to Caie, the supervaluationist who holds this meta-semantic account will endorse the position that (a) and (b) jointly fail to determine a unique classical assignment (many of which will be equally good), but succeed in determining a supervaluationist model as the intended interpretation.

The relevant use facts for egalitarianism, he claims, pertains to our hedging behaviour in borderline cases – given the plausible assumption that there will be overlap amongst the linguistic community over where we hedge. Following Caie – and ignoring higher-order indeterminacy for simplicity – suppose that the relevant hedging occurs for ‘tall’ over some region of heights from 5’9” to 6’. For simplicity, let’s ignore trust for a moment and focus on just truthfulness. My hedging behaviour seems to be such that I’ll assert ‘Bob is tall’ only if I believe that Bob’s height $\geq 6'$, and assert ‘Bob is not tall’ only if I believe his height $\leq 5'9''$ – and, thus, I’ll hedge by asserting neither if I believe his height to be between these values. Now consider a precisification of ‘tall’, ‘tall*’ on which the cut-off is 5’10”/11”. I’ll assert ‘Bob is tall*’ only if Bob’s height is $\geq 5'11''$. But, trivially, since $5'11'' < 6'$, ‘tall*’, I’ll be willing to assert ‘Bob is tall’ only if I’m willing to assert that he’s ‘tall*’. Similarly, I’ll be willing to assert that he is ‘not tall’ only if I’m willing to assert that he’s ‘not tall*’. Likewise trust. Thus, goes the thought, it’s compatible with our use – *qua* dispositions of truthfulness and trust - of ‘tall’ that it express ‘tall*’. As such, we’ll be truthful and trusting in any

¹⁵¹ That is, of tendencies to assert *S* only if one believes its content, and to believe that content in response to others assertions of *S*.

precisification within that region, and so the use facts will deem them equally good. Coupled with the plausible claim that none of these precisifications is more intrinsically eligible than any other, the meta-semantic facts will deem each precisification equally good – they will not discriminate between those precisifications falling within the hedging region.

Caie's challenge to this story is as follows. He claims that fit and intrinsic eligibility are also insufficient to determine a unique *supervaluationist* interpretation.¹⁵² Suppose we have a candidate supervaluationist interpretation that has, as precisifications, classical models with a sharp cut-off for each point in the hedging region. The problem, he claims, is that such an interpretation scores no better than an alternative supervaluationist model whose precisifications are a *subset* of the original.¹⁵³

Why does he claim this? The precisification 'tall*', recall, is compatible with my truthfulness dispositions, it was claimed. Caie's thought thus seems to be as follows: since any of the precisifications individually fits with my truthfulness dispositions, any supervaluational model with an arbitrary subset of those precisifications - including, as we just saw, singletons - fits with them too. Likewise dispositions of trust. So, he claims, use facts don't determine amongst such supervaluational models. Given that none seem more intrinsically eligible than any other¹⁵⁴, there's no unique supervaluationist interpretation. Indeed, since those supervaluationist

¹⁵² Nor, he claims, does a supervaluationist interpretation obviously score better than any of the *classical* interpretations with cutoffs in the hedging region.

¹⁵³ The problem is actually meant to be that, given that fit and intrinsic eligibility don't suffice to fix a supervaluationist model, something else must. But those things must then be considered relevant to the determination of precisifications, on pain of meta-semantic double-standards. We don't need to go that far up the dialectical tree in order to criticize Caie's claims.

¹⁵⁴ He considers and rejects (plausibly) some options here.

models with a unique precisification are equivalent to a classical interpretation, the meta-semantic facts don't score any supervaluationist model better than several classical models either.

This looks troubling. Thankfully, the supervaluationist has a straightforward response. Caie's conception of the use facts seems to deny hedging any substantial meta-semantic efficacy – at least, the sort of efficacy that a type-1/2 supervaluationist deems them to have: as responsible for *gaps*. The supervaluationist will deny that it *is* compatible with the use of 'tall' that it expresses any of the classical (non-gappy) interpretations. Sure, she can say, she'd assert 'Bob is tall' only if she was willing to assert 'Bob is tall*', but that's insufficient to show that 'tall*' is compatible with her use of 'tall'. On the contrary, the very fact that she hedges between 5'9" and 6' renders any sharp cut-off in that region incompatible with the use facts. Indeed, we can witness this straightforwardly: even though I'll be willing to assert 'Bob is tall' only if he's 'tall*', I *won't* be willing to assert 'Bob is tall*' only if he's 'tall', and that's precisely because I'm disposed to hedge at points where 'tall*' tells me I can assert. Moreover, it's exactly this fact that renders unintended the peculiar supervaluationist models Caie introduces: the gaps they yield fail to correspond to the hedging region, and so fail to accurately predict where speakers will hedge.

Does this mean that she's abandoning egalitarianism? No. She can still say that the classical interpretations corresponding to the precisifications do equally well at fitting with the use facts, and indeed that they do better than those which set the cut-off outside of the hedging region. Nevertheless, they also do equally badly at failing to square with the gap effected by the fact of hedging, quite in contrast to the intended supervaluationist model. Thus, the type1/2 supervaluationist should be unmoved by Caie's objection.

Caie also makes a similar complaint against type-3 glut supervenualism (*plurivaluationism*) – the account that denies that there is a unique intended interpretation *qua* supervenualist model, but that rather treats precisifications themselves as the (multiple) intended interpretations.

His complaint in this case eventually mirrors the preceding, but problems emerge much earlier on. A confusion emerges early on in his claim that, on the plurivaluationist meta-semantic picture, “...given our use of language, the correct characterisation of the representational properties...is given by the plurivaluationist theory that *assigns* all of the [precisifications as interpretations]...” (p.24, my emphasis). Similarly, “If there is more than one [precisification] that is at least as good as any other, then the correct semantics is given by a plurivaluationist theory.” (p.25) The problem is that he is effectively treating the plurivaluationist theory as *itself* an interpretation/assignment. This results in several misconceptions.

First, he goes on to complain that the correctness of plurivaluationism must render the precisifications unintended, because plurivaluationism assigns *multiple* contents, unlike precisifications. This belies a confusion of plurivaluationism (*qua* type-3 glut) with a view of interpretation as a non-functional relation (*qua* type-2 glut). Plurivaluationism, however, is *not* a semantic theory – not an interpretation in its own right – rather, it’s a *meta-semantic* hypothesis countenancing multiple intended interpretations.

Second is the claim that it makes sense to assess plurivaluationism in terms of intrinsic eligibility and fit. This is misguided – those considerations measure semantic theories, and again, plurivaluationism is *not* an interpretation.

Third, this leads to a mistaken search for what the truth-conditions are which are, supposedly, assigned by plurivaluationism. He offers the claim

that the sentence has the truth-condition of being true just in case it is true on every precisification. But this is just to reduce plurivaluationism to type1/2 supervaluationism. He claims that rejecting such a truth-condition requires embracing the (supposedly implausible) claims that either a sentence may fail to be true even though it's true on every interpretation, or may be true although false on some interpretation. But these options aren't exhaustive: what the plurivaluationist will say is that the sentence *is* true *relative* to an interpretation.

These complaints aside, Caie's objection may still have force against plurivaluationism – the complaint being, again, that the meta-semantic facts fail to determine that a hedging-region correspondent set of precisifications scores better than any arbitrary subset of it. In this case, of course, we're not concerned with precisifications *qua* members of a supervaluationist interpretation, but with precisifications as interpretations in their own right. But, once we've rightly abandoned the idea that plurivaluationism is itself a candidate interpretation, it's unclear what the objection is supposed to be.¹⁵⁵ It can't be that any individual precisification (*qua* classical model) is intended – that's the view! The objection cannot be that some arbitrary subset of the precisifications are the *only* intended interpretations: Caie's argument takes as a premise that we'll be truthful and trusting in any precisification within the hedging region, and thus that the use facts will deem them *all* equally good (thus, equally intended).¹⁵⁶

¹⁵⁵ Caie seems to suggest the problem is a *conflict* between how the precisifications can be determined as intended *along with* plurivaluationism *qua* semantic theory. That problem is a non-starter given that plurivaluationism is *not* an interpretation in its own right. Still, I'm concerned here that there might be a residual objection, even if it is not exactly that posed by Caie.

¹⁵⁶ That is, the original allegation was that individual precisifications are just as good candidates for being intended as any supervaluational model comprised of them. The plurivaluationist would only have a problem if it turned out that some of the precisifications in the hedging region turned out not to be unintended, but there's no obvious reason why they would be excluded. Well, aside from the thought of the level1/2 supervaluationism that hedging yields non-classical interpretations. That's a bone of contention between these varieties of

Summary

In this chapter, outlined an abstract model of what the *nature* of indeterminacy might look like, in order to illustrate show the similarities of accounts of metaphysical indeterminacy with more familiar accounts, and to provide guidance in so constructing a theory. Moreover, I illustrated the utility of that model, and of some prior distinctions, by employing them to illuminate some importantly distinct varieties of supervaluationism. Finally, I utilised those distinctions to undermine some recent efforts to argue for metaphysical indeterminacy on the back of semantic considerations.

Chapter 3

The nature of metaphysical indeterminacy

The previous chapter offered a very general model of possible theories of indeterminacy. In this chapter, we'll look at (a) how that model can be applied to make sense of *metaphysical* indeterminacy; and (b) certain substantive theories exemplifying some of the options so outlined. The value of (a), I hope, will be to help further allay suspicion about metaphysical indeterminacy by enabling us to appreciate just how structurally akin it is to non-metaphysical theories, varying only in the 'arena'.

In 3.1 I make clear how we can make sense of metaphysical indeterminacy in a way that makes explicit its structural similarities with non-metaphysical theories of indeterminacy, exhibited the space of theories available – including several unexplored options. In 3.2 I engage with a particular substantive theory of metaphysical indeterminacy in terms of truthmaker gaps. In 3.3. I engage with a different, but related, theory that employs fundamental determinables. In 3.4 I engage with a theory that treats metaphysical indeterminacy as primitive.

3.1 The space of theories

As I said previously, a theory of the nature of indeterminacy consists in a choice of arena, species, flavour, source, and a type-identity claim identifying indeterminacy with the phenomena so defined. A ton of putative metaphysical arena have been discussed in the literature, most

commonly objects and their boundaries, or properties and their extensions. However, there is available a much more general conception of the arena of metaphysical indeterminacy which can encompass many of these more 'local' choices – entire possible worlds. This point has been emphasised by both Akiba (2000) and Barnes and Williams (2010), but the employment of worlds can be exploited beyond their particular proposals. To be explicit about this, let's employ a set of ersatz worlds constituted out of ersatz states of affairs as follows:¹⁵⁷

L: Actuality

S: An set of ersatz worlds $\omega = \{M, P, \mathcal{S}\}$: where M is a set of ersatz individuals, P a set of ersatz properties, a set of ersatz states of affairs such that (a) $|a|, |b| \dots |z|$ represent atomic positive states of affairs, and $|a'|, |b'| \dots |z'|$ their negative siblings; (b) $|a \wedge b|$ represents a conjunctive state of affairs which is the mereological sum of $|a|$ and $|b|$; (c) $|a \vee b|$ represents a disjunctive state of affairs identical to $|a' \wedge b'|$; (d) $|p x|$ represents the existential state of affairs of there being something that instantiates p .¹⁵⁸

I: The actualisation relation.

A: A relation from reality into **I**, picking out the *actualised* world ω^* .

¹⁵⁷ A development and defence of a view of ersatz worlds similar to that hereby countenanced can be found in Jago (2011). All that really matters for our purposes here is that we have the representational resources to represent non-standard worlds, and for that purpose we might piggy-back on many of the frameworks for impossible worlds available.

¹⁵⁸ I set aside familiar concerns about ersatz frameworks. There are complications that may arise, though, once we consider non-standard worlds to be actual. For instance, consider that we might render the ersatz worlds in a lagadonian language. In an actualist setting, this raises the familiar issue concerning alien properties and individuals. Jago (2011) proposes to resolve this by claiming that the alien properties will be constituents of actually obtaining negative states of affairs – a move that will be unavailable to us if we adopt a type-2 gap view and hold that, actually, some alien property is such that no positive state of affairs containing it obtains, and no negative state of affairs containing it obtains.

The simple conception of the preceding arena holds that \mathcal{S} contains only maximal and complete ω (i.e. for each $|a| \in \mathcal{S}$, either $|a|$ obtains or $|a'|$ obtains, but not both), that the actualisation relations in I map exactly one ω to actuality (i.e. exactly one world is actualised), and that reality selects exactly one actualisation relation as correct.

Metaphysical indeterminacy can be modelled by a modification of the simple arena by way of a choice of any of the species and flavours discussed in the previous section. In this case, we can modify the conception of worlds, actualisation, or the conception of correctness. Type-1 views expand \mathcal{S} by supplementing the available worlds. The most straightforward way is to introduce worlds with *sui generis* indeterminate of states of affairs $|\nabla a|$. Akiba (2004) has offered a type-1 glut conception, where we admit worlds that are built out of classical worlds, variation amongst them constituting a 'precificational dimension'.¹⁵⁹ Type-2 views modify the actualisation relation. It's more useful to think of actualisation in this case as relating reality to states of affairs directly, rather than to worlds. In that case, we can understand the gappy non-total flavour as yielding states of affairs gaps - cases where neither $|a|$ nor $|a'|$ obtain - and the glutty non-relational flavour as cases where both obtain. Both of these options have been prominently endorsed by Greenough (2008) as we'll discuss below, and the former by Jessica Wilson (2013). Finally, type-3 views modify correctness. The most prominent such view is that of Barnes & Williams (2010), whereby it's primitively indeterminate which actualisation relation is correct.^{160, 161} A great deal many of these options are unexplored. In the

¹⁵⁹ The accounts of 'metaphysical dialetheia' developed by Kroon (2009) and Mares (2009) might also be diagnosed thus.

¹⁶⁰ The type-3 glut view does *not* correspond to Williams's 'multiple actuality' view, in spite of the name. That appearance occurs only because William's applies 'actuality' to all the worlds that aren't determinately non-actual - there's still only a single actual world on his account. I suspect that a type-3 glutty view may, however, capture Finean (2006) Fragmentalism.

remainder of this chapter, however, I want to probe three extant views in detail. These views are united by their motivating ambition to retain

¹⁶¹ Though I won't concern myself with metaphysical *vagueness* much, it's worth commenting on the main (if not only) challenge to an extension of metaphysical indeterminacy into a theory of metaphysical vagueness. Horgan (1994) and Heller (1996) argue that *metaphysical* vagueness is unviable by appeal to 'step arguments', or 'forced march' sorites. These are scenarios involving a sorites series along which we are asked to pass judgement on each case, one by one, from one end to the other. The worry is that there will always be a sharp-cut off point at some order, as evidenced by a change in judgement by the respondent. The relevance for us concerns putative metaphysical sorites, such as might be thought to arise on a theory of restricted composition (e.g. van Inwagen (1990)). The challenge arises from the thought that handling forced march sorites must involve, they suggest, appeals to context-sensitivity and judgement dependence. Crucially, these are phenomenon which, they allege, are not deployable by the theorist of *metaphysical* vagueness. Two comments about this are worth making. First, the demand that there be *no* change in judgement seems unsatisfiable – indeed, it seems like a requirement of judgement-tolerance. But *nobody* apart from incoherentists are capable of meeting such a requirement. Indeed, it's not even clear how resources like context sensitivity or judgement dependence are supposed to help with *this* problem (even if they're useful for other reasons): there are plausibly some cases on the series, at the extreme end, that couldn't be judged one way or the other, or are such that *no* context would permit them to be judged in some way or other. And, moreover, for any particular such context there will be a cut-off at some order or other. Perhaps, then, the real complaint against theories of metaphysical vagueness here is not that they must posit a cut-off *per se*, but rather that the *location* of any such cut-off is fixed in a manner that fails to permit faultless interpersonal disagreement about the location, or about judgements in particular cases – where that's taken as data. The thought would be, I suppose, that there's no room for such faultlessness in the case of metaphysical vagueness, because the *world* will fix the appropriate judgement (even if that's an expression of some order of indeterminacy). But, this seems very presumptuous. I see no reason to take such putative *faultlessness* as data, rather than mere *blamelessness* – it seems like the most we can assume as data is that speakers aren't to be *blamed* for any (possibly faulty) judgements along a forced march sorites. We could well admit that it's metaphysically indeterminate where the boundary of Everest is, and that there is a first point at which it something is not super-definitely a part of Everest, whilst still allowing that speakers may permissibly make different judgements over that point, because of the epistemic difficulties yielded by the indeterminacy. The theory of metaphysical indeterminacy isn't tied to stringent judgement norms, and we can allow that divergent strictly false judgement may nevertheless deemed *good enough*. Moreover, the advocate of metaphysical indeterminacy can accommodate such by permitting that there may well be a role for contextual features governing such acceptability. In sum, the felicitousness or acceptability of a judgement doesn't always require strict truth, and the epistemic obstacles yielded by instances of metaphysical vagueness may well provide good reason to postulate such permissive judgement norms to govern claims made about them. As such, the proponent of metaphysical vagueness should be unmoved by concerns about forced-march sorites.

classical logic. We'll find that the type-3 primitivist view fares better, over its type-2 rivals, but is nevertheless limited in its scope.

3.2 Greenough's Truthmaker gaps

Patrick Greenough (2008) has proposed an account of indeterminate truth by appealing to truthmaker theory. This yields an intuitive development of the view of M-indeterminacy as 'worldly underdetermination'. In this chapter I critically assess his proposal, and find it comes with some restricting metaphysical baggage. After outlining Greenough's position, I'll discuss some objections. 2.1 discusses objections to his notion of 'ungrounded truth', but finds them unpersuasive. 2.2 discusses objections to the adequacy of ungrounded truth as an account of indeterminate truth, which are more troubling. 2.3 discusses the metaphysical upshot of Greenough's proposal, threatening the viability of one of his formulations.

Greenough is motivated to develop an account of indeterminate truth that is fully classical.¹⁶² The core of Greenough's idea is to pair bivalent truth-bearers with some way of disconnecting their truth-values¹⁶³ from the world – yielding 'ungrounded' truths/falsities.¹⁶⁴ The

¹⁶² His motivation is the 'Wright-Williamson challenge' to theories of indeterminate truth. See Wright (1987), Williamson (1994).

¹⁶³ Given his desire to give a classical theory, this should be read as Boolean truth-values. It is worth noting however that nothing ties the theory to Boolean truth-values other than the classicist motivation – that is, one could just as well apply the notion of ungroundedness to non-Boolean truth-values. One might, for instance, think that some propositions have a non-Boolean truth-value but are not indeterminate, properly so called.

¹⁶⁴ The view is clearly related to that of Kearns & Magidor (2012). They hold that where use-facts don't settle determinate semantic-values, a semantic value is fixed brutally and arbitrarily. As such, in a sorites for instance, there is a sharp cut-off, and determinate truth value for the predication of a vague predicate to every member in the series – it's just brute and arbitrary which. Brute and arbitrary truth-values pick up the slack left when meaning lets us down. But meaning is only half of the story about truth-values – the world also gets in on the action.

grounded/ungrounded truth-value distinction is thereby identified with the determinate/indeterminate truth-value distinction.

He offers two developments of 'groundedness', the latter to accommodate those who reject truthmaker maximalism¹⁶⁵:

I1: $\langle p \rangle$'s truth-value is grounded (determinate) iff $\langle p \rangle$ has a truth/false-maker; otherwise it is ungrounded (indeterminate).

I2: (A contingent) $\langle p \rangle$'s truth-value is grounded (determinate) iff its truth-value 'supervenies on being';¹⁶⁶ otherwise it is ungrounded (indeterminate).¹⁶⁷

Greenough's claim is that such brute and arbitrary truth-values are also yielded when the world – not usage (or any other meaning-fixing) facts – let us down.

¹⁶⁵ How is the idea of 'ungrounded truths' consistent with the appeal to truthmaker theory – won't countenancing such undermine any prior truthmaker motivations? It does not: truthmaker theory should instead just be recast, in this context, as a claim about determinate truths having truthmakers ('determinate' here, of course, should be read as 'actually determinate' rather than 'determinate according to the truthmaker theorist', on pain of triviality). Roughly, the distaste of brute truths, for the truthmaker theorist, is that a propositions having some particular truth-value tells us something about the world, and thus ought to be ontologically accountable – and that brutally true/false propositions, in lacking ontological ground, seem utterly arbitrary. But recasting the view as suggested can still allows us to express such distaste. The thought is that the particular truth-values of ungrounded propositions are arbitrary, but that their particularity tells us nothing about the world – rather, their very arbitrariness does. No bit of ontology truthmakes an ungrounded truth, but an ungrounded proposition's being ungrounded is ontologically accountable.

¹⁶⁶ This raises, of course, the familiar question of what ontology is intended by 'being' – does it include objects, states of affairs, universals, tropes etc. The account is neutral on this question, though sometimes below, I'll treat it as encompassing just the totality of objects for simplicity. Given the dialectic (viz, accommodation of non-maximalism), however, 'being' should be taken to exclude 'negative truthmakers'.

¹⁶⁷ Actually, he treats sentences as the primary truth-bearers in order to be able to distinguish semantic indeterminacy. I'll ignore this for simplicity. The rough idea is that semantic indeterminacy arises when $\langle S \rangle$ expresses $\langle p \rangle$ is true/false but ungrounded. That is, when the world is gappy regards some metalinguistic state of affairs.

I1 secures ungroundedness by countenancing the possibility of truthmaker gaps: that $\langle p \rangle$ lacks a truthmaker and a false-maker.¹⁶⁸ (This talk of ‘false-makers’ is perhaps a little unorthodox, but we can otherwise interpret the idea as proposing that neither the truthmaker for $\langle p \rangle$ nor $\langle \neg p \rangle$ obtain, presuming $\langle p \rangle$ is false iff $\langle \neg p \rangle$ is true. I’ll stick with Greenough’s ‘false-maker’ notion henceforth.)

On I2, if $\langle p \rangle$ ’s truth-value fails to supervene, it must be the case that it be possible for $\langle p \rangle$ to differ in truth-value without there being a difference in ‘being’. So, an ungrounded proposition is one which can have non-identical truth-values at distinct indiscernible worlds: $\langle p \rangle$ can be T in w and F in v although there’s no difference in their population. Prima facie, if there’s no difference in w & v ’s population, it cannot be the case that $\langle p \rangle$ has a truthmaker within their identical populations; otherwise $\langle p \rangle$ would be made true in v & w . Likewise, it cannot have a false-maker in the population, otherwise $\langle p \rangle$ would be made false in v & w . Thus, for $\langle p \rangle$ to be indeterminate, it is necessary that it lack a truthmaker and a false-maker in w & v . (Again, presuming $\langle p \rangle$ is false iff $\langle \neg p \rangle$ is true, this requires that $\langle p \rangle$ and $\langle \neg p \rangle$ lack truthmakers). So, if $\langle p \rangle$ ’s truth-value fails to supervene, the world must be ‘gappy’ p -wise. Note, however, that once one gives up maximalism, one will think this sort of situation arises for any true negative proposition.¹⁶⁹ Still, truthmaker gappiness is necessary of ungrounded propositions, even if insufficient. I2 is thus a relaxed version of I1, easing

¹⁶⁸ Sometimes below I will talk of the truthmaker and falsemaker for $\langle p \rangle$ not obtaining, ignoring that the truthmaking relation is plausibly many-many. This is just a simplifying assumption.

¹⁶⁹ One might think that the non-maximalist isn’t really committed to truthmaker gaps proper in the case of negative truths because they don’t think that $\neg p$ fails to obtain, for they don’t think there’s any such thing as $\neg p$. I don’t think there’s anything really substantive at issue here, one can distinguish truthmaker gaps and truthmaker gaps* if one cares about such. I don’t think anything I say will be undermined by such a distinction.

the need for truthmakers for negative truths.^{170,171}

Below I'll consider objections both to the notion of ungroundedness itself, and to its identification with indeterminate truth.

3.2.1 Preliminary worries

There are some preliminary worries with the proposals which call out for discussion at the outset.

First, I1. Any world with a truthmaker gap is in an intuitive sense 'ontologically underdetermined'. The postulation of such is, unsurprisingly, not new. Rescher & Brandom (1980), for instance, partly characterise the space of impossible worlds with 'schematic worlds', which look to be an expression of the same idea. They are also occasionally mentioned in discussions of the plausibly dual notion of ontologically over-determined glutty worlds - those featuring metaphysical dialethia. One might question the coherence of the idea of a truthmaker gap, or of 'gappy worlds'. There's a corollary of Williamson's objection to truth-value gaps lurking:

¹⁷⁰ Perhaps one can achieve the same effect without countenancing truthmaker gaps. Truth also fails to supervene on being if $\langle p \rangle$ is true in w and false in v although it has a truthmaker/false-maker in both. To do this, one would have to deny necessitarianism à la Parsons. At the risk of rendering all truths indeterminate, one must however somehow localise such to particular propositions. I won't pursue this further, not least because the idea of a truthmaker which doesn't necessitate the truth of a truth-bearer seems dubious, especially when localised. (Necessitarianism has its critics of course (Heil and Mellor for instance), but it's difficult to see how to build in the requisite localism).

¹⁷¹ One might further clarify the account of indeterminacy being offered by distinguishing the following two theses, denial of which are each sometimes labelled 'indeterminacy': 1) p obtains or does not obtain 2) p obtains or $\neg p$ obtains. We could think of these as a sort of 'ontic bivalence' and 'ontic LEM' respectively. Non-maximalists, along with Greenough, deny (2). On I1, failure of (2) suffices for ungroundedness. On I2, failure of (2) is necessary but insufficient for ungroundedness. Neither I1 nor I2 deny (1). Denials of (1) are characterised as 'indeterminacy' by Dummett (2006) and Williamson (2003). Denials of (2) are characterised as 'indeterminacy' by Rescher and Brandom (1980).

P1) TM-gappiness requires 'not: p obtains \vee $\neg p$ obtains'.

P2) Classically this entails that ' $\neg p$ obtains & $\neg\neg p$ obtains'.

C) So, TM gaps entail contradictions.^{172,}

This is misguided. ' p ' and ' $\neg p$ ' here name truthmakers, and the argument mistakes those names for logically complex formulae. This can be remedied by just ensuring we italicise appropriately. The argument then goes: not: p obtains \vee $\neg p$ obtains, so $\neg(p$ obtains) $\&$ $\neg(\neg p$ obtains). Contradiction avoided.¹⁷³

A different worry targets I2: that if the supervenience at issue is strong supervenience, it looks as though which propositions are determinate, and which are indeterminate will be necessarily so (assuming S5): after all, if $\langle p \rangle$ strongly supervenes on being, there's no world at which it fails to strongly supervene – if it fails to strongly supervene at some world it fails to strongly supervene at all. Yet, it does at least seem intuitive that for some indeterminate $\langle p \rangle$, it could have been determinate, and that some determinate $\langle p \rangle$ could have been indeterminate. (This is especially pressing in the case of semantic indeterminacy – surely it's not necessary that 'bald' is semantically indeterminate. Yet, on this construal of the view, 'bald' is vague amounts to ' x is bald' expresses $\langle p \rangle$'s truth-value not supervening on being.) This oddness is ramified if, as I claimed above, supervenience failure requires gappiness – for if $\langle p \rangle$ is actually indeterminate, this then entails that every possible world is gappy p -wise – thus that truthmakers for $\langle p \rangle$ and $\langle \neg p \rangle$ are impossible. This seems odd. If this is correct then, the retreat from maximalism seems to incur a

¹⁷² Moreover, this entails truthmaker gluts given maximalist presuppositions.

¹⁷³ That this objection fails should be unsurprising - after all, non-maximalists (who must conceive of negative truths as cases of truthmaker gaps) would thereby be committed to a blatant contradiction, and it would be surprising if such had gone unnoticed.

significant cost.¹⁷⁴ Consequently, it might be thought that Greenough's model forces us to choose between maximalism or the necessity of determinacy statuses, a choice which many will not relish. Moreover, one might think that the idea thereby fails to capture the intuitive notion of 'indeterminate truth'.

How to respond? I suggest that Greenough avail himself of a weaker notion of supervenience that will allow for contingency. Normally, we say that 'If A supervenes on B then worlds which are indiscernible B-wise are indiscernible A-wise', where we quantify over worlds unrestrictedly. However, we can introduce a restricted notion of supervenience_R whereby we quantify only over some proper subset of possible worlds R. We can thereby say that A supervenes_R on B, or equivalently, that A supervenes on B within region R ('worlds in R which are indiscernible B-wise are indiscernible A-wise').

Strong supervenience and weak supervenience are just special cases of this. A strongly supervenes on B iff A supervenes_R on B where R includes every possible world. A weakly supervenes on B iff A supervenes_R on B for every R which contains a single world. Applying this to the case at hand, we can then say that $\langle p \rangle$'s truth-value supervenes_{R1} on being, but doesn't supervene_{R2} on being, where $R1 \neq R2$. If the proponent of I2 formulates her claim with this restricted notion, she can thereby rescue the contingency of (in)determinacy statuses by construing statements of contingency (e.g. ' $\langle p \rangle$, though indeterminate, could have been determinate') as legitimised by the fact that we could have been in some non-actual R.

So, the proponent of I2 should countenance the following: $\langle p \rangle$ is determinate in R iff $\langle p \rangle$'s truth-value supervenes_R on being, otherwise it's indeterminate. However, this introduces another oddity. Supervenience

¹⁷⁴ I1 clearly avoids this objection – it only requires that neither of p nor $\neg p$ actually obtain.

claims are now evaluated relative to some R. Without constraints upon region forming, the actual world might belong to several R, each of which will deliver different verdicts upon whether A supervenes upon B.¹⁷⁵ In the present case, this means that whether a proposition is determinate or not will be relative to R. This seems to land Greenough in a dilemma.

The first horn tells against embracing such relativity. Three reasons tell against such. First, a proposition might thereby be both determinate and indeterminate at w relative to different R (which is to say, whether/where a world exhibits metaphysical and semantic indeterminacy will be relative to an R). Second, every proposition will be determinate relative to any R containing only one world.¹⁷⁶ Third, only actually false positive propositions and actually true negative propositions will permit this sort of relativity over their determinacy statuses. (A positive true proposition $\langle p \rangle$, if determinate, has a truthmaker. Given necessitarianism, it can be seen quite quickly that there is no R such that $\langle p \rangle$'s truth-value doesn't supervene on being, for there can be no indiscernible world – where the truthmaker still obtains – where $\langle p \rangle$ is false.¹⁷⁷). Each consideration seems massively counterintuitive, such as to undermine the I2's claim to be a putative analysis of indeterminacy were one to pursue this.

To ensure against those worries then, it must be stipulated that worlds belong to a unique R – that the R-profile of modal space has non-overlapping R- regions. I don't think this stipulation troublingly ad hoc. Why not? Well, the proponent of I2 needn't say how modal space is carved

¹⁷⁵ How? Imagine two regions made up of worlds: $R1 \langle w, v, x \rangle$ and $R2 \langle w, x, y \rangle$. $\langle p \rangle$ might be false at w & v, true at x & y, though a truthmaker for $\langle p \rangle$ obtains at only x. Thus, truth supervene $R1$ on being, but doesn't supervene $R2$ on being.

¹⁷⁶ There will be no world in such an R indiscernible qua 'being' but with propositions having different truth-values, for there aren't other worlds in R.

¹⁷⁷ There can, of course, be worlds where being doesn't supervene on truth: where $\langle p \rangle$ remains true although the truthmaker doesn't obtain there.

up into R regions in any detail. The shape of our actual R region, for instance, will go along with whichever propositions are actually determinate, and which actually indeterminate. But settling which propositions are indeterminate is quite a different task from settling what their indeterminacy consists in. Likewise, for non-actual R – it isn't the present task to state which/whether <p> could have been indeterminate, merely to explain how they could be. (We can be epistemically guided by intuitions about which propositions are (actually and possibly) (in)determinate (i.e. about what the R-profile of modal space is) without ruining the reductive credentials of our metaphysical theory of what (in)determinacy is. (Cf. Lewis's reductive ambitions.)) In just the same way the absoluteness of determinacy statuses is not an appropriate explanandum for an account of M- indeterminacy. That determinacy statuses are absolute is just data to be fed into our characterisation of what modal space's R-profile is, but it doesn't need to be explained by the account of (in)determinacy.

However, the second horn results from asking which non-overlapping R-regions are correct. The worry here is that either the stipulation is utterly arbitrary. There are, after all, many non-overlapping R-profiles of modal space, each of which will deliver different verdicts for the indeterminacy statuses of propositions. I can accordingly have a plurality of notions (indeterminacy, indeterminacy*, indeterminacy** etc.) – why ought I think any one corresponds to the 'correct' assignment of determinacy statuses. While there may be room for a conventionalist view here, it seems clear that insofar as one wishes to be a realist about (in)determinacy, one ought to think some R-profile to be somehow metaphysically privileged. Consequently, the proponent of I2 can accommodate the contingency of determinacy statuses, but at the cost of incurring extra ideology.

3.2.2 Objections

3.2.2.1 Against ungrounded truth-values

There are many theorists who postulate something like ungrounded or 'brute' truths¹⁷⁸, and they have an explicit advocate in Azzouni (2006)¹⁷⁹. Nevertheless, it is clear that there is a general distaste for them – indeed, such seems to underlie the pre-theoretic deployment of truthmaker maximalism. Yet there are, unfortunately, often only gestures at reasons for rejecting them.¹⁸⁰ Here are some candidates.

(a) 'There is no reason why ungrounded propositions have the particular truth-values they have.'

Driving this is the acknowledgement that indiscernible worlds might deliver divergent truth-values for ungrounded propositions. It is difficult to see what might constitute an objection on this basis however. While it is plausible that such truth-values present an epistemic challenge, this doesn't seem enough to bar their possibility - rather than serving as motivation to

¹⁷⁸ By 'brute truth' I mean a truth which is not truthmade. A potentially distinct notion is that of a truth which is not true in virtue of anything. These only come apart if one supposes that a proposition can be truthmade but not be true in virtue of anything. There are two corresponding conceptions of truthmaker theory: as the thesis that no true propositions (or all positive, contingent propositions) are brute, or as the thesis that the only brute truths are pure existential truths. I employ the first notion. See Cameron (forthcoming) for the second. I'm not convinced there's any substantive difference between the two however, I just take the first to be the closer to the intuitive notion, and I find it intuitive that if an entity truthmakes a proposition, then the proposition is true in virtue of the entity. A further distinct notion is of a truth which is truthmade by a 'brute fact', a fact which does not hold in virtue of any other ('fact' here understood as a state-of-affairs rather than a true proposition).

¹⁷⁹ "...truth vehicles can be true without there being a metaphysical trace in the world..."

¹⁸⁰ Armstrong (1989) admits as much when he declares himself unable to argue for the truthmaker principle beyond pointing out that it is "fairly obvious once attention is drawn to it..." It is perhaps further evidenced by the situation whereby those who do countenance them are subjected to name-calling: "cheaters!"

group them with, say, the continuum hypothesis and other undecidables. Indeed, it's hardly unusual to hold that indeterminate propositions truth-values are epistemically unassailable – this very idea is at the heart of epistemicism for instance.

Perhaps what is thought troubling is the seeming arbitrariness of truth-value assignments to brute truths. But why think this arbitrariness objectionable? One reason looks plainly question-begging: arbitrary assignments are insensitive to how the world is.¹⁸¹ But this reason is nevertheless, I think, what lies behind the intuition that arbitrariness is problematic. Arbitrariness only appears worrisome because we're used to thinking of grounded propositions which are, by virtue of their supervening, non-arbitrary. But once we entertain ungrounded propositions, arbitrariness is harmless. Ungrounded propositions do have arbitrary truth values, but this isn't objectionable precisely because they're ungrounded – intuitions to the contrary are piggy-backing on grounded cases. At best, then, the arbitrariness objection is merely restating a prejudice against ungrounded truths rather than providing a justification for such.

(b) 'It is mysterious how ungrounded propositions can have any truth-value given that there is nothing in virtue of which they have them.'

The challenge posed here is to explain how ungrounded propositions get any (even arbitrary) truth-values whatsoever. The whole model of indeterminate truth depends, after all, upon securing that propositions have truth-values, in order for them to be (in)determinate (qua 'mode' of truth/falsity). It is tempting to read Greenough as suggesting that it is bivalence that somehow guarantees a truth-value for each proposition,

¹⁸¹ Moreover, in one respect this accusation is false. Although a particular (arbitrary) assignment is insensitive to how the world is, that the assignment is arbitrary isn't – while truth-values might not supervene on being, their (non-)arbitrariness does.

even in spite of truthmaker gaps. The idea, then, would be that in the case of ungrounded propositions, their being bivalent somehow picks up the slack, doing the work which 'being' fails to do. But this is confused. Greenough needn't think that the truth of bivalence explains the possession by each proposition of a truth-value. Rather, the truth of bivalence just is what it is for each proposition to possess a truth-value. His commitment to bivalence isn't playing the theoretical role of the explanans sought by this objection; it is just an expression of the explanandum.¹⁸²

Anyway, this objection is misguided in seeking an explanation, for the truth-values hold brutally. In so far as the requested explanation is a request for what it is in virtue of which the truth-values hold, the request is misplaced. The objection fails to have any force unless supplemented by an explanation of

why brute truths are mysterious. Insofar as there is any objection along these lines, it appears to be pointing out nothing more than the unintuitiveness of ungrounded truth-values. However, this intuition (like

¹⁸² Indeed, it would be unwise to employ it so. The mere statement of bivalence would be an insufficient response - one would need to state why bivalence holds. Plausibly, if it holds, it holds of necessity, and it is tempting to think this necessity could serve as the explanans. This would be problematic for two reasons. 1) Wielding the necessity of bivalence as an explanans would be dialectically inappropriate: truth-value gap theorists will deny that bivalence is necessarily true in the presence of worldly underdetermination. The necessity of bivalence is thus itself part of the explanandum at issue; 2) It is incapable of fulfilling the job (on I1 at least): Greenough rightly suggests that necessary truths aren't brute qua ungrounded, lest this make them implausibly indeterminate (and, he thinks, thereby unknowable), given the presumption of maximalism. Rather, he thinks, their 'bruteness' consists in their having 'primitive truthmakers'. Consequently, the proposal would amount to the view that every proposition (even ungrounded ones) has a truth-value because of such a primitive truthmaker for bivalence - that is, for every $\langle p \rangle$, it truthmakes $\langle \langle p \rangle$ is true or $\langle p \rangle$ is false \rangle . However, this clearly won't do. In the case of ungrounded propositions, this disjunction must be made true although neither disjunct is (Greenough is friendly to such possibilities. Also see Read (2000)) - otherwise, the proposition would be grounded after all. But, if the disjunction can be made true without the disjuncts being made true, then it remains a mystery as to why either of the disjuncts is true - and thereby, mysterious why each proposition possesses a truth-value.

any other) is not sacrosanct – the cost of abandoning it is to be weighed in with the alleged advantages of ungrounded truths. One could of course try to bolster this claim from mere intuition by way of a correspondence theory, or some other substantive theory of truth which makes the intuition partly constitutive of truth.¹⁸³ Given the dialectical weakness of such a strategy, I'll set it aside.

(c) '(1) If <p> is true then there is a state of affairs of <p>'s being true. (2) But this state of affairs plausibly necessitates the truth of <p>. (3) If it necessitates the truth of <p>, it is a truthmaker for <p>. (C) So, any true <p> has a truthmaker, contra the thesis of ungroundedness.'

Many will no doubt want to take issue with the conditional here – it will certainly be contested by those who deny that there is a property of truth. Nevertheless, I'm happy to grant it. What I think really goes wrong with this argument is the third premise – in particular, its conception of the truthmaking relation as merely a relation of necessitation. There are various independent and convincing arguments against the idea of treating the truthmaking relation as necessitation, and so I think that the best response to this argument is to thereby reject this premise by adopting one of the alternative characterisations of the truthmaking relation instead. Not just any alternative will do however: Lowe's essentialist construal, and Merricks's 'aboutness' construal arguably still fail to defuse this objection. Greenough still has other options though – he can construe the truthmaking relation as grounding (Rodriguez-Pereyra (2005), Schaffer (2009)) or as in virtue of (Cameron (2008)). Moreover, there are clearly independent reasons for holding either of these positions, enough to prevent such a response from seeming ad hoc. The upshot, of course, is that Greenough's

¹⁸³ I'm presupposing that truthmaker theory, contrary to some theorists, isn't itself a theory of truth. Rather, truthmaker theory explains what makes true propositions true, whatever it is to be true.

account can't be quite as neutral on truthmaking as he hopes.

(d) 'There is an open question about the status of bivalence as a metasemantic principle. Yet, given that gappy worlds don't undermine it, there is no conceivable situation such that even if it were metaphysically possible, bivalence wouldn't hold.'

The worry here is that the preservation of bivalence in gappy worlds, if credible, undermines the intuitively open question regards its status as a metasemantic principle – and that this makes it unanswerable to metaphysics. And, the thought goes, bivalence shouldn't be metaphysically immune in this way. There is obviously much that is questionable in this – not least the idea that it should be answerable to metaphysics. Moreover, even if the premises are true, it's not clear why we shouldn't just treat it as an argument for bivalence. Nevertheless, even granting all this, the argument errs at the final step in thinking that bivalence, in being compatible with gappy worlds, thereby floats free of metaphysics. This is misguided: exceptions to bivalence could be easy to come by - they'll show up wherever the truth of a proposition fails to supervene on being and that proposition does not have a brute truth-value. Any world like that, if metaphysically possible, would thereby undermine bivalence.

Of course, Greenough won't want to say this, but it is not a necessary component of the theory that any proposition which doesn't have a truth-value which supervenes is thereby guaranteed an arbitrary brute one. Greenough's commitment to this is a result only of his being motivated to give a classical theory. If one lacks sympathies for classicism, one need only claim this of the indeterminate truths, and thereby still make room for truth-valueless truth-bearers within the theory.

There is, however, still a lingering worry in the vicinity. It charges that the classicism Greenough recovers is somehow second-rate. The thought proceeds from a more worldly view of logic than it seems Greenough is

giving: that regardless of our having a classical semantics, that the world is metaphysically gappy ought to be reflected in our logic.¹⁸⁴ We could readily distinguish two kinds of logic here, and say that Greenough is only concerned with giving us a classical logic*, where logic* isn't worldly in the objectors sense. This will then raise questions, of course, as to the dialectical suitability of this. I won't push this further, for it will take us far afield into philosophy of logic. It suffices to point out that there may be room here for arguing that Greenough's classicism is somehow got 'on the cheap'. Even so, it remains that all that would be damaged is the classicist element of the theory.

(e) 'Brute truths are an explanatory cost to a theory.'

This objection emphasises that each brute truth a theory accepts is a cost to it, because they are, by their very nature, unexplained – so the more brute truths we countenance, the less explanatory our theory. The alternatives to brute truths, however, seem to be to either enrich our ontologies, to enrich our ideologies, to reject plausible propositions as false (which will still also have ontological costs given maximalism), to countenance truth-value gaps, or to deny that certainly intuitively meaningful expressions are meaningful (e.g. in the case of the semantic paradoxes). These are all costs too. Thus, this objection doesn't suffice as an objection – it only attains a semblance of credibility because of its narrow focus on a single type of cost.^{185,186}

(f) 'For a truth-bearer to be true is for its truth conditions to be satisfied, and truth-conditions are satisfied by the world. So truths must supervene on

¹⁸⁴ C.f. the proponent of metaphysical dialethia who salvages classical semantics by saying that overdetermined propositions have an arbitrary unique truth-value, thereby salvaging LNC.

¹⁸⁵ The dialectic here is identical to that between Tallant (2010, 2012) and Cameron (2013).

¹⁸⁶ This is not to deny that brute truths may eventually lose out in an overall cost-benefit analysis.

being.'

The first part of this objection appears pretty uncontentious, at least insofar as 'the world' is taken broadly to include the obtaining of assertibility or verification conditions – that is, as long as truth-conditions aren't understood narrowly as correspondence conditions. Consequently, many approaches to truth, realist and anti-realist alike, forge a link between truth and satisfaction of truth-conditions.¹⁸⁷ (The only theorists who might take issue are deflationists.) Nevertheless, for all its relative agreeableness, it looks as though Greenough will deny it in the case of ungrounded truths. These propositions are true in spite of their truth-conditions failing to be satisfied – that's why they're ungrounded. The premise thus question-beggingly presupposes what's at issue. (The rejection of the idea that truth requires satisfaction of truth-conditions is closely related to the rejection of the principle 'If $\langle p \rangle$ then p obtains'.¹⁸⁸ They're not equivalent however: the latter is rejected by non-maximalists (where ' $\neg p$ ' stands in for ' p '),¹⁸⁹

¹⁸⁷ I thereby mean by 'truth conditions' something broad enough for even Dummett to be included.

¹⁸⁸ Greenough calls something like this principle 'FACT' ("If p then it is a fact that p "). However, it's possible that 'it is a fact that p ' in FACT means something broader than ' p obtains', or, that FACT is restricted to positive truths. It must if its rejection is to be characteristic of Greenough's position.

¹⁸⁹ Greenough offers an argument for rejecting this principle over the truth-value gap theorists rejection of 'If $\langle p \rangle$, then $\langle p \rangle$ is true'. The argument has 2 premises: 1) the truth-value gapper must reject both if they hold 'If p obtains then $\langle p \rangle$ is true'; 2) They must hold this last principle in order to explain why there's 'no fact of the matter' where there's a truth-value gap. In one respect, one might dismiss this as equivocation over 'no fact of the matter'. More charitably, we might view Greenough as thinking that the truth-value gapper needs to not only hold that there is 'no fact of the matter' in the sense of ' $\langle p \rangle$ is neither true nor false', but also in the sense of 'neither p nor $\neg p$ obtain'. One might argue that he's burdening the truth-value gapper with unnecessary commitments – they need only hold that there is no fact of the matter in the former sense, thereby rejecting the premise 2. However, this would be misguided, at least in the truthmaker context: if there's a truth-value gap, it can't be that p or $\neg p$ obtain, lest $\langle p \rangle$ thereby be made true/false, i.e. non-gappy. Premise 2 thus looks plausible, and the argument sound. (The only way I see to avoid the argument is to appeal to the 'localised failures of necessitarianism' discussed below).

but they will not reject the idea that a sentence being true involves the satisfaction of its truth-conditions.)

One could, however, try to insist that satisfaction of truth-conditions is partly constitutive of truth (again, though, this will likely be rejected by deflationists). One could thereby allege that Greenough's 'indeterminate truth' is 'truth' only in name. This is possibly troublesome for it would seem to show that 'indeterminate truth' is not a 'mode' of truth at all, but at best a distinct species of truth. This threatens to undermine the notion's utility, for one may now insist that all the troubles for which it was wheeled in to solve remain untouched insofar as they concern truth-conditional truth. If future contingents, or the semantic paradoxes, are issues for truth-conditional truth, or threaten bivalence for truth-conditional truth, then it seems like introducing another species of truth fails to help.

I think there's definitely something to this line of argument, but evaluating it fully will require engaging with debates over the theory of truth. This will be no small task and again, will have limited dialectical effectiveness. So, I set it aside for now.

3.2.2.2 Against ungrounded truth as indeterminate truth

While I don't pretend that the preceding objections are exhaustive, the idea of ungrounded truth-values seems quite resilient. None of the canvassed objections establish decisive problems with ungrounded truths, and in lieu of an argument via a more substantive account of truth, the notion looks to be in good standing. Even granting the notion however, one might yet object to Greenough's identification of ungrounded truth with indeterminate truth. The worry in this section is that ungrounded truth is extensionally inadequate as an account of indeterminate truth.

An initial objection charges that Greenough's account of indeterminacy fails to capture the notion of indeterminacy because worlds with Greenough-

style indeterminacy are, in some sense, fully precise. With truthmaker gaps, for instance, p and $\neg p$ both fail to obtain. But then the world seems to be in a completely precise state – a truthmaker gap, a third precise state.

We must be careful how we present this objection though. We can't just say that the 'world is precise' on Greenough's model - if 'precise' means determinate, then given his account of indeterminacy, it isn't precise: a proposition about the relevant state of the world is ungrounded, so indeterminate, and thus not precise. The accusation of imprecision must be presupposing a prior notion of determinacy. Why think that presupposed notion correct?

One way to proceed would be to try to argue from analogy. We could do that by considering some nearby models of indeterminate truth: 1) Suppose that truthbearers have a special 'bivalence-enforcing property' (BEP) which serve as a fail-safe that throws out an arbitrary truth-value when the truth-value isn't determined by being-, where being- is being minus the BEP. There's a clear intuitive sense in which the propositions whose truth-value is delivered by a BEP, while of a kind importantly different from those which don't, nevertheless don't seem to be in any way indeterminate. 2) Suppose there are truthmaker gluts ('worldly dialethia', 'worldly over-determination'), but that propositions all nevertheless obey the Law of Non-Contradiction. There's a clear intuitive sense in which these propositions, while of a kind importantly different from those which don't suffer truthmaker gluts, nevertheless don't seem to be in any way indeterminate.³²

But what is relevantly different from these models and Greenough's? If these don't seem to warrant being called 'indeterminate truths', why would Greenough's? This way of arguing clearly has its limitations. First, it presupposes that either of (1) and (2) are coherent. Second, it is open to Greenough to claim that the intuition is just wrong in these cases, and that

these positions, if coherent, point to the possibility of there being different 'modes' of indeterminate truth.

Anyway, a more appropriate way of proceeding is to try to isolate the source of the precision intuition, and to argue that other notions of indeterminacy can meet it. I think the intuition has its source in the intuition that there is 'no fact of the matter' in cases of indeterminacy. Greenough himself thinks the 'no fact of the matter' intuition plays a central role in the 'ordinary conception of worldly indeterminacy'. But, I think he at best simplifies its content, and at worse mis-characterises it. He thinks it amounts to this:

There is no fact of the matter about 'p' just in case p and $\neg p$ fail to obtain.

That is, he thinks the intuition is one of worldly gappiness. But there seems to be a distinct intuition bundled into the locution:

There is no fact of the matter about 'p' just in case either p obtains or it doesn't, but the world hasn't settled which.

Consequently, it seems the 'no fact of the matter' locution points to two distinct phenomena. Most importantly, there are theories of indeterminacy which seem to capture the latter: Williamson (2003) and Barnes and Williams (2010) both propose theories which seem to capture it. The resultant disagreement here is about whether indeterminacy is a third state or whether it is a sort of middling between two states. The latter intuition, contra Greenough, doesn't say that there is no fact, just that there is no fact such that it is 'of the matter'. This, I think, is at the core of the worldly precision objection.

How ought we diagnose this situation? Is only one of these phenomena 'indeterminacy' proper, or are there two species of indeterminacy here: 'indeterminacy as underdetermination' and 'indeterminacy as unsettledness' as we might call them? I think there are good grounds for

suspicion of 'indeterminacy as undetermination' as bona fide indeterminacy (at least, in its truthmaker development). I'll press this by objecting that there are many examples of ungrounded truths which intuitively are not indeterminate.¹⁹⁰

It is permissible for a theory to be slightly revisionary of course – but only up to a point. Overthrowing intuitions is a cost which escalates with the quantity of intuitions overthrown. Further, I think some intuitions are of a particular kind that their abandonment is very costly. In particular, those intuitions which serve to fix the very phenomenon being theorised about. For instance, if we wish to reductively identify what it is to be liquid water, we might naively characterise it merely as H₂O. But, when this has the upshot that steam is liquid water, we don't seem entitled to shrug our shoulders and pronounce that steam is, contrary to intuition, liquid water. The reason is that the intuition that steam is not liquid water has a central role in fixing the very phenomenon being theorised about. Once such intuitions (or perhaps enough of them) begin to be abandoned, it looks as though we're just missing our target phenomenon φ . The cost is then not just mere unintuitiveness – it begins to undermine the aspirations of the theory to be a theory of φ at all.

The problem with Greenough's proposal, I think, is that it upturns such 'phenomenon-fixing' intuitions in droves – classifying several cases which don't seem indeterminate as so. Thus, it seems as though ungrounded truth fails to capture the target phenomenon of indeterminate truth. Many putatively ungrounded truths just do not seem to be candidates for

¹⁹⁰ One could press the objection in the other direction – that there are some indeterminate truths which are not ungrounded. This is more difficult to mount, however, for it will require we identify some truths as indeterminate yet truthmade, which will presumably require pushing an alternative model of indeterminacy. This is clearly dialectically weaker than the former strategy which requires only that we identify some candidate ungrounded truths as not indeterminate.

indeterminate truths. This is well evidenced by the following candidates for ungrounded truths:

- Varieties of Presentism and Actualism with brutally true/false propositions about the past/future or non-actuality.¹⁹¹
- Quine's (1948) ungrounded (by his nominalism) true predications.
- Rylean (1949) Behaviourism's brute behavioural dispositions. (At least, on one interpretation of Ryle.)
- Lange's (2009) grounding of laws of nature in brute counterfactual truths.¹⁹²
- Millian (1865) phenomenalism's brute counterfactuals about the unperceived.¹⁹³
- Rayo's (2013) Trivialism about mathematics.

Whatever the viability of any of these views, one problem they don't seem to have is that they render intuitively determinate truths (about the past, possibility, behaviour etc.) as indeterminate. Yet, if Greenough's position is correct, all of the above would be committed to indeterminacy in their respective domains. But it then appears, as in the H2O case above, that the

¹⁹¹ Whether this charge is fairly applied to Presentism per se is questionable. Lewis (1999) seems to think it does. At the least, Prior (1968) and Tallant (2010) seem committed to brute truths. See also Keller (2004).

¹⁹² At least, on one interpretation they're brute counterfactuals. Sometimes his talk of 'subjunctive facts' sometimes sounds suggestive of sui generis entities which truthmake the counterfactuals.

¹⁹³ I once thought that Milne's (2005) sentence: 'This sentence has no truthmaker' also belonged on this list. However, it is only ungrounded given the presumption of maximalism, and I'm pretty sure that my intuitions that it isn't indeterminate are driven by the thought that its truth-value nevertheless supervenes. Further, I find the idea that the Liar is indeterminate so be not at all unintuitive, and given its proximity to the Liar, it might be thought to carry over to the Milne sentence.

phenomenon of ungroundedness just fails to adequately narrow in on the intuitive phenomenon of indeterminacy. So, it seems, we have not been offered a theory of indeterminate truth at all.

Greenough might respond in one of three ways. I'll argue that none of them are adequate.

First, he may dig his heels in and insist that our intuitions about the cases above are just wrong. I don't think much can be said in response to this, just as I don't think much more can be said to anyone insistent that steam is liquid water – I'd be reduced to giving an incredulous stare.

Second, he might try to deny that the cases above are ungrounded, contrary to the appearance of such. He seems to do something like this with logical and mathematical truths in the context of maximalism, where he suggests that their intuitive 'brutality' consists not in their being ungrounded, but in their having 'primitive truthmakers'. I read him as offering two suggestions.¹⁹⁴ First, that they have sui generis states of affairs as truthmakers. This burdens the positions with qualitative ontological costs. It looks more credible in the cases with counterfactuals, since it may amount to something familiar like a dispositional property. It looks more peculiar in the Quinean predication, presentist and actualist cases – though suggestions in this vein aren't completely unfamiliar (see Keller (2004) for discussion). The latter suggestion takes $\langle p \rangle$ is true/false as a brute fact which truthmakes $\langle p \rangle$ - the move is thus to brute facts from brute truths. I noted above the dissatisfaction deflationists might have about such facts. But even if we countenance facts such as $\langle p \rangle$ is true there's something more curious about the claim that they're brute. Once we've countenanced

¹⁹⁴ "Perhaps such truths have primitive truthmakers as follows: 'If p & q then p ' is true in virtue of the fact that: if p & q then p (or true in virtue of the fact that 'If p & q then p ' is true)."

such states of affairs, it seems plausible that to truthmake $\langle p \rangle$ is to make it such that $\langle p \rangle$ is true obtains. The suggestion thus amounts to the claim that $\langle p \rangle$ is true obtains in virtue of $\langle p \rangle$ is true. But, understanding a brute fact as one which doesn't obtain in virtue of anything, it is thereby not a brute fact – rather it is a sort of 'self-sustaining' fact. Following through on this suggestion thereby burdens the positions with the view that 'in virtue of', contrary to orthodoxy, can be reflexive. While either of these might be coherent positions, this response is clearly flawed in viewing either of these as interpretations of the positions above. And, whilst Greenough may be able to construct these nearby surrogates for those views, this nevertheless doesn't detract from the fact that none of them as originally developed, seems to be committed to indeterminate truths.

One might think: "Well, so much the worse for their original developments – why should Greenough be hostage to these views?" That is, one might question why this is more Greenough's problem than the proponents of the views outlined. The dialectical burden is murky here. Once one has availed oneself of ungrounded truths one thereby faces the choice of whether or not to identify them with indeterminate truths. (The proponents of the views above will reject such an identification. Greenough will instead suggest that the only viable forms of those views are those which appeal to one of the strategies just outlined.) Who has the upper hand here depends upon what support each side can muster in favour of their supposing that they should/shouldn't be identified. But, in both cases, each is motivated by the desire to explain some particular phenomena (indeterminate truth, truths about the past etc.). Fully undermining this kind of response, then, can only be achieved by establishing that – even given the supposition of their being ungrounded truths – that there is insufficient reason to identify them with indeterminate truths. Appraising this response must therefore be deferred until we have fully appraised alternative accounts of indeterminate truth.

Third, he might concede the point about the cases above, and treat ungroundedness as too coarse grained, yet insist that indeterminacy is still a type of ungroundedness. There's a risk here in that the supplement mustn't be either sufficient enough to make talk of ungroundedness redundant, or introduce appeal to a prior notion of determinacy. I think this is the most promising way forward. The key is to find a difference between the ungrounded truths like above and those which seem to be genuinely indeterminate.

What could be appealed to? An intuitive suggestion is that he distinguish the indeterminate ungrounded truths from the determinate ones as those which are only contingently ungrounded. Many propositions' determinacy status, as I urged above, ought to be contingent. But, *prima facie*, if any of the truths suggested as brute in the list above are brute, it seems as though they are brute necessarily. So, the suggestion is:

a) $\langle p \rangle$ is indeterminate iff $\langle p \rangle$ is ungrounded but could have been grounded.

We can then reserve 'brute' for the other forms of ungrounded propositions:

b) $\langle p \rangle$ is 'brute' iff it is necessarily ungrounded.

Unfortunately, this proposal faces challenges in two directions. First, against (a), there is the spectre of propositions which seem to be necessarily indeterminate – the continuum hypothesis for example.¹⁹⁵ Second, against (b), there is the threat of metaphysical contingentism – if, for instance, Cameron's (2007) metaphysical contingentism about

¹⁹⁵ This might be regarded as untroubling if their indeterminacy can be otherwise explained. The account might then be salvaged by restricting the explanandum to only contingently indeterminate truths. I don't rule this out, though of course it is methodologically preferable to seek a unified account if such can be achieved.

composition is correct, this would undermine the 'brutalism' of Markosian (1998) given this biconditional. So, it doesn't look as though this simple supplement is up to the job.¹⁹⁶

A related suggestion looks more promising however. The thought is that the theories listed above, while appealing to ungrounded truths, are additionally not truthmaker-apt. That is to say, ungrounded truth-values can have two sources: either as a consequence of the proposition not being ontologically sensitive (as in the cases above), or by being ontologically sensitive but by none of the relevant bits of ontology obtaining.

Consequently, to handle these worries about extensional adequacy, the proposal ought to be modified such that the indeterminate propositions are not merely those with ungrounded truth-values, but rather a species of ungrounded ungrounded propositions which are ontologically sensitive or 'truthmaker-apt'.

3.2.2.3 Against truthmaker gaps/supervenience failure

Thus far we've found no convincing objections. However, there are a series of metaphysical objections which are more troubling, at least for the I2 variant of the view.

The ungroundedness of a proposition seems like a curious place for an explanation of indeterminacy to terminate. What we want to know is how the world must be to yield ungroundedness. This is particularly important insofar as our fundamental concern is with extracting an account of M-indeterminacy from Greenough's account.

I'll approach this by noting a curious upshot of I1 & I2: the rejection of the

¹⁹⁶ Another intuitive suggestion is that the indeterminate truths, unlike the ungrounded truths adumbrated above, are 'truthmaker-apt'. It's difficult to see how we could cash this out without it's collapsing into the view just outlined however – i.e. $\langle p \rangle$ is truthmaker-apt just in case it could have been grounded.

following intuitive principles:

If no truthmaker for $\langle p \rangle$ obtains, then $\langle \neg p \rangle$ is true. If no truthmaker for $\langle p \rangle$ obtains, then $\langle p \rangle$ is false.¹⁹⁷

Even non-maximalists will countenance these.⁴⁶ Why think these principles sacrosanct? One might try to challenge this rejection directly, and argue as follows:

- 1) If no truthmaker for $\langle p \rangle$ obtains, then it must be untrue;
- 2) By LEM, $\langle \neg p \rangle$ must therefore be true/by bivalence, $\langle p \rangle$ must be false.

But this won't do: Greenough will resist (1) – he'll claim that a proposition might be true in spite of its lacking a truthmaker, for it might have an ungrounded truth-value. Asserting (1) is therefore question-begging.

Criticism of their rejection must instead be executed by arguing that their rejection is metaphysically problematic. Maximalists and non-maximalists will approach this differently.

Maximalists must have a metaphysical story about why the non-obtaining of a truthmaker for $\langle p \rangle$ somehow metaphysically necessitates the obtaining of a truthmaker for $\langle \neg p \rangle$ (or false-maker for $\langle p \rangle$). One resource which maximalists do have at their disposal to guarantee such is to appeal to a totality fact to act as a truthmaker for negative truths. This is evidently hostile to truthmaker gaps, and Greenough must thereby reject totality facts. Even accepting local negative truthmakers for negative propositions however doesn't get Greenough home safe, for one might identify $\neg p$ with

¹⁹⁷ The maximalist can endorse the stronger: if no truthmaker for $\langle p \rangle$ obtains, a truthmaker for $\langle \neg p \rangle$ obtains; or, if no truthmaker for $\langle p \rangle$ obtains, a falsemaker for $\langle p \rangle$ obtains. I.e. those who think that the (unreified) lack of truthmakers suffices for the truth of negative truths.

p's non-obtaining.¹⁹⁸ Given maximalism, this amounts to the suggestion that we reify p's non-obtaining. One way of developing this thought looks ridiculous – by thinking of p having a property of non-obtaining: for $\neg p$'s obtaining (and so, by hypothesis, p's not obtaining) will always, thereby, entail that p obtains (by being a 'part' of the former state-of-affairs). Another more plausible way is to take sides on the debates over the metaphysics of holes, and to identify $\neg p$ with, so to speak, a truthmaker-for- $\langle p \rangle$ -hole. Discussing this fully will of course take us afar. However, we can readily acknowledge that there is no threat to Greenough here. Such stories must be deployed by maximalists to explain why maximalism holds, but Greenough – of course - rejects maximalism given his appropriation of ungrounded truths. There is an analogue to the maximalist/non-maximalist debate in Greenough's framework over whether all determinate propositions have truthmakers/falsemakers (as opposed to merely supervening on being). As I claim below, the 'non-maximalist' position faces severe difficulties. However the 'maximalist' view seems in good standing regards its coherence.

Matters are more troubling for non-maximalists. Rejecting these principles seems to involve abandoning an idea common to non-maximalists (indeed, one that for some seems to partly motivate their rejection of maximalism): that negative truths, while not truthmade, are true in virtue of the (unreified) lack of a truthmaker. Retaining this thought would spell trouble for I2: an ungrounded proposition is one capable of being either true or false given the state of the world. To be capable of falsity (at this or an indiscernible world), $\langle p \rangle$ must lack a truthmaker. But if this suffices to for the truth of $\langle \neg p \rangle$, and thus the falsity of $\langle p \rangle$, $\langle p \rangle$ cannot be true. So, it is not capable of being either true or false after all, so is not ungrounded.

¹⁹⁸ Greenough might embrace this for the truth/falsemakers of some determinate propositions, but at the cost of denying their determinacy statuses are contingent.

So, it seems, I2 must reject the idea that negative truths hold in virtue of a lack of truthmakers. But, then, why are determinate negative truths true? Merely saying that negative propositions' truth-values supervene on being is empty: we want to know why they supervene, and we've been robbed of half of the explanation. This point is pressing when it comes to asking about the nature of indeterminacy. Ungroundedness doesn't suffice as an explanation – we need to know what about the world is responsible for a propositions being ungrounded. On I1 the answer is straightforward: the world has truthmaker gaps. But, on I2, just saying that, for indeterminate propositions, 'truth doesn't supervene', is unilluminating without an idea of how truth manages to supervene for determinate propositions – of how the world manages to settle their truth-values. Once we've abandoned the standard non-maximalist account of such (that $\langle p \rangle$ has or lacks a truthmaker), we're left in the dark as to how the world has to be to not settle truth-values.

Failing to explain this is a problem in two respects: First, it becomes unclear what distinguishes determinate negative truths from indeterminate truths if determinate negative truths get their truth-values neither by a truthmaker nor even by a lack of one.¹⁹⁹ Second, the idea that there may even be another way for negative truths to have their truth-values grounded looks suspicious: what other than a truthmaker or a lack of one could do?²⁰⁰ Overall then, I2 suffers considerable explanatory poverty.

¹⁹⁹ I presume it implausible that one simply embrace the indeterminacy of all negative truths (and positive falsehoods), while allowing that some positive truths might be determinate. That's a bizarre asymmetry.

²⁰⁰ What if one tries to explain supervenience failure by saying that it can be indeterminate whether p obtains. If the indeterminacy here invoked is primitive, then we'll have scuppered our hopes for a reductive account. Could we construe it as ungroundedness? That is, could we suggest that $\langle p \text{ obtains} \rangle$ might be ungrounded, and thereby indeterminate. No: this would be to explain supervenience failure by ungroundedness, but supervenience failure is meant to explain ungroundedness. This thus collapses in circularity.

Claiming that indeterminate truths are those for which 'truth doesn't supervene on being' seems like a modal fig leaf.

How might the defender of I2 respond? They might point out that the argument depends upon the idea that a propositions truth value is sensitive to the obtaining or lack of a truthmaker. One way for someone who denies that truth supervenes on being would be to claim that some (perhaps all) propositions are not sensitive to the obtaining/lack of a truthmaker. This is presumably what, for instance, coherentists about truth think about all propositions: the way they get the truth-values they do just has nothing to do with ontology. Likewise, is what I suggested above is what distinguished those theories listed earlier: the truths about the non-present or other possible worlds has nothing to do with ontology; for Quine, true predications have nothing (beyond the values of the bound variables of objectual quantifiers) to do with ontology etc. The defender of I2 can thus maintain that they needn't abandon the standard non-maximalist explanation of how determinate negative truths supervene – they can distinguish the determinate negative truths from indeterminate truths by claiming that the latter, unlike the former, are 'ontologically insensitive' – they don't track ontology.

But, predictably, this looks unappealing - it seems to land the proponent of I2 in a dilemma. On the one hand, the examples of propositions plausibly construed as 'ontologically insensitive' seem to be so necessarily - when one says they 'have nothing to do with ontology', this plausibly means that there is no possible thing which could serve as a truthmaker for them, or lack thereof. This sits comfortably with actualism, presentism, Ostrich nominalism etc., since these views are usually thought necessary by their proponents. On this model of what it takes for a propositions truth to not supervene then, it looks to do so necessarily. However, if indeterminate truth is to be squeezed into the same box, then it looks as though the indeterminacy statuses of propositions will – implausibly - be necessary. It

seems to me that this is so unintuitive as to arouse suspicion that we're not hereby dealing with indeterminate truth at all.

On the other hand, one might try and salvage their contingency by claiming that it can be contingent whether a proposition is ontologically sensitive. The claim would be that for some negative proposition, for instance, it is sensitive to lacks in some worlds but not in others.²⁰¹ The resultant view is thus:

<p> is determinate iff either i) it has a TM or ii) it lacks a TM and is sensitive to the lack of a TM.

But this is an awkward position – how is such contingent sensitivity to be accounted for? Is the proposition itself meant to be somehow intrinsically insensitive to lacks in some worlds but not in others? Or, is there some sort of inhibitor effective at some worlds which prevents the lack of a truthmaker from conferring a truth-value on a proposition? Developing either of these views looks unenticing and ad hoc. In either case, it looks implausible to consider any such weird phenomena as ‘indeterminacy’, and such contortions engender the suspicion that we’re flogging a dead horse.

I’ve presented several objections to Greenough's proposed account of indeterminate truth. Many have been found wanting, but a few seem to indicate serious difficulties for the program. First, the notion of ungrounded truth proved resilient – though I did indicate a couple of open lines of attack via a substantive theory of truth. Second, the intuitions which threatened ungrounded truth’s ability to play the role of indeterminate truth seemed manageable: I there argued that although Greenough has slightly mis-targeted the phenomenon of indeterminate truth, it is easily ammended. Finally, I criticised the metaphysical underpinnings of ungroundedness. I2,

²⁰¹ This would require the falsity of, as it were, ‘lack necessitarianism’. Whether this can cohere with truthmaker necessitarianism of course merits discussion, but I set it aside here.

in particular, was shown to face a dilemma which seemed to render ungroundedness a phenomenon far removed from indeterminacy on either horn.

In conclusion then, what are the prospects for an account of indeterminacy as underdetermination cashed out in terms of truthmakers? I have argued for the following constraints on such an account: 1) Its only plausible development requires the presupposition of maximalism; 2) The requisite maximalism cannot appraise itself of totality facts; 3) It requires a particular conception of the truthmaking relation; 4) It's vulnerable to attack from substantive theories of truth and the nature of logic. These are very restricting commitments. Of course, these worries may turn out to be unfounded: perhaps, for instance, the limited conception of truthmaking required is correct. But, given a reasonable desiderata on a theory of metaphysical indeterminacy for neutrality, we have some motivation for seeking a theory with less baggage.

3.3 Wilson's Determinables based view

Some of the difficulties with the prior view sprang from its attempt to secure classicality in the face of 'fact-gaps' with arbitrary truth-value assignments. An alternative means of securing classicality would be by employing some additional ontology to secure classical theorems. Jessica Wilson (2013) suggests a view that may fulfil that role. She contrasts her proposal with theories which diagnose metaphysical indeterminacy as that phenomenon whereby the world is somehow unsettled between various (determinate) candidate states of affairs – and, consequently, where there is (non-epistemic) indeterminacy in whether some (fully determinate) truth-conditions are satisfied (i.e. type-3 views).²⁰² Rather, according to her, metaphysical indeterminacy is manifest in the

²⁰² She counts Evans, Parsons and Woodruff (1995), Barnes and Williams (2010), Barnes and Cameron (2009), Morreau (2002), and Barnett (2009) as endorsing this kind of view.

(determinate) obtaining of a special kind of state of affairs: one involving the (determinate) instantiation of a determinable that is either under- or over-determined. That is, a state of affairs involving the (determinate) instantiation of a determinable, and either the (determinate) instantiation of several corresponding determinates, or the (determinate) non-instantiation of any corresponding determinates. Whereas Greenough proffered a type-2 gappy view, Wilson thus instead provides us with a type-1 gappy view of metaphysical indeterminacy – one which countenances a novel kind of indeterminate state of affairs.²⁰³ For instance, to take a purported case of metaphysical indeterminacy from quantum mechanics: her diagnosis is that, prior to opening the box, Schrodinger's cat instantiates a determinable like <having a life-status>, but neither of that determinables corresponding determinates <being alive> and <being dead>. This is thereby diagnosed as a case of an undetermined determinable state of affairs.

More precisely, the proposal is this:

A world w exhibits metaphysical indeterminacy just in case:

- a) There is, at w , a state of affairs involving a fundamental determinable F ; and
- b) that state of affairs also either
 - i) fails to involve any determinate falling under F ; or
 - ii) involves multiple determinates falling under F .

How do things look semantically on this account? Wilson doesn't explicitly offer a semantics, but considering this will help draw out the contrast with Greenough a little better.

²⁰³ As per the opening of this chapter, the appeal to states of affairs is eliminable here: I utilise such talk just because it is the least cumbersome way of expressing the idea. Also, I make no commitment over what it is for a state of affairs to 'involve' its constituents, or whether indeed it is more or less fundamental than those constituents. (Wilson's appeal to fundamental determinables could easily be supplanted with fundamental determinable states of affairs)

Return to the case of Schrodinger's cat. The account diagnoses this as a situation where the cat instantiates a determinable like [having a life-status], but where that determinable is undetermined, where for it to be undetermined is for neither of that determinable's corresponding determinates [being alive] and [being dead] to be instantiated.

The proponent of the view owes us a semantics: in particular, we want to know what the truth-value is of <Schrodinger's cat is alive> and <Schrodinger's cat is dead>. It seems like a fairly orthodox semantics – one on which <Fa> is false if *a* fails to instantiate F – will judge both of these propositions as false, in virtue of Schrodinger's cat failing to instantiate the determinates. But, this looks like an implausible position for two reasons:

- 1) It seems intuitively as though it is *not* false that the cat is alive/dead – indeed, this is partly what motivates our interest in the cat's predicament, and our suspicion that this is a case of metaphysical *indeterminacy*. Moreover, given the falsity of <Schrodinger's cat is alive>, it is plausibly not true that <It is indeterminate whether the cat is alive>, at least not if an object language determinacy operator is to track – as might be expected – such meta-linguistic facts.
- 2) Additionally, there are very plausible biconditionals holding between these propositions that must now be abandoned. Intuitively, for instance, <Schrodinger's cat is alive> is true iff <Schrodinger's cat is dead> is false. This biconditional must be rejected in order to avoid the result that <Schrodinger's cat is alive> is both true and false.

To this end, the most promising semantics involves the abandonment of the principle that $\langle Fa \rangle$ is false iff a fails to instantiate F . What could it be replaced with?

One suggestion is to piggyback on $\langle Fa \rangle$ is false iff $\langle \neg Fa \rangle$ is true, and then invoke negative determinates wholesale in order to ground the truth of propositions of the form $\langle \neg Fa \rangle$. However, the ontological profligacy of this aside, this move also renders fundamental determinables redundant. It's worth pausing to consider why the appeal to determinables is being made at all. It is straightforward to see that simply not instantiating [being alive] and [being dead] doesn't suffice for manifesting metaphysical indeterminacy: plausibly, a table instantiates neither of these, but it does not exhibit metaphysical indeterminacy in respects of being alive. Fundamental determinables are wheeled out in order to distinguish these cases: Schrodinger's cat, unlike the table, instantiates a determinable of [having a life-status]. But, once one invokes negative determinates, there is no need for fundamental determinables to play this role. Schrodinger's cat will be diagnosed as lacking all of the determinates [Alive] [\neg Alive] [Dead] [\neg Dead]. But the table can now be straightforwardly diagnosed as not being a case of metaphysical indeterminacy in virtue of its instantiating [\neg Dead] and [\neg Alive]. Invoking negative determinates would thereby eradicate the need to appeal to fundamental determinable in accounting for cases of underdetermination, contrary to the spirit of the account. As such, it essentially collapses into a variant of the maximalist species of Greenough's proposal discussed above.

A better alternative, then, would be to embrace something like the following:

<Fa> is false iff (a) *a* fails to instantiate F; and (b) *a* instantiates some other determinate G which is co-determinate with F^{204,205}

Given the intuitive principle for truth, this yields the result that <Fa> is neither true nor false in cases of under-determination. <Schrodinger's cat is alive> is thus indeterminate since the cat fails to instantiate [being alive] and [being dead] (which, we are to suppose, are the only determinates under the relevant determinable which the cat does instantiate).

Why think this theory attractive? Wilson suggests several suggestions in favour of the view: (1) That the account offers a reductive account of MI; (2) That the account utilises familiar theoretical machinery in order to make metaphysical indeterminacy intelligible; (3) That the account is capable of systematically handling all intuitive instances of MI; (4) That the account best preserves intuitions about those instances – in particular, the intuition that there is ‘no fact of the matter’. Moreover, Wilson suggests that these considerations not only render the account attractive, but also that they suffice to establish its appeal over rival theories. I will argue below that she overstates the effectiveness of these purported advantages.

²⁰⁴ This will have to be complicated if we think that <Fa> can be indeterminate, where 'F' refers to some property that falls under no determinable – and unless the determinable-determinate hierarchy is 'junky', it's plausible there will be such properties. Indeed, this seems like an issue for the approach generally, semantics aside. I'll set the worry aside for now.

²⁰⁵ I'm understanding this biconditional to be governing falsity *simpliciter*, and thus to involve the abandonment bivalence. So understood, this strategy involves rejecting the Tarskian falsity schema. Alternatively, one might think that, when *a* (determinately) fails to instantiate F, <Fa> is false, and then instead let the biconditional govern a notion of 'determinate falsity'. But, then 'determinate falsity' and falsity come apart – with bivalence holding for the latter but not the former – such that <Fa> can be false, but not determinately false. This seems less appealing given that, not only does it involve the extravagant postulation of 'determinate truth-values', but it also fails to respect the intuition that it's indeterminate whether <Fa> is (plain) false.

Moreover, I will claim, the account has some unattractive features that actually make it look like a comparatively *unappealing* theory of MI.²⁰⁶

3.3.1 Reductiveness

There are two reductive aspects of Wilson's theory that should be distinguished: (a) that it constitutes a non-primitivist flavour of indeterminacy by appealing to gappy states of affairs, (b) and that it in turn reduces gappy states of affairs by appealing to fundamental determinables.²⁰⁷

Why think such reduction important? One thought may be that the reductive character of the account endows it with an ideological parsimony advantage over primitivist rivals. This, however, is far from clear. Whilst it eschews commitment to primitive metaphysical indeterminacy, it pays for that by appealing to an unorthodox conception of the determinable-determinate relation: one that can exhibit under-/over-determination. Whilst the required appeal to *fundamental determinables* might be secured by independent considerations²⁰⁸, those considerations do not require stretching the conception of determination conception in this way – so this bit of ideology isn't even independently motivated.²⁰⁹ Indeed, the situation might be even worse for the proposal if

²⁰⁶ There is, of course, room for objecting to the hypothesis of fundamental determinables on which the theory depends. However, I'm willing to grant that this hypothesis is both coherent and independently well motivated. I wish to establish that even granting this resource, the account is an unattractive theory of MI.

²⁰⁷ Thus, it is in the first respect that the account competes with Barnes and Williams (2010), and the second that it competes with those, like Burgess (1990) and Parsons (2000), who postulate gappy states of affairs.

²⁰⁸ See Wilson (2012), for the scientific and modal considerations in favour of fundamental determinables. Roughly, the reasons are twofold: (1) that determinables seem to feature irreducibly in scientific explanations and laws; (2) that determinables are required to ground some modal truths.

²⁰⁹ It is also for this reason why one could not claim any value in the reduction arising from an increase in explanatoriness, for the unorthodox conception of determination wasn't, as it were, already lying around in our box of explanans. It

under-determination and over-determination constitute *two* new bits of ideology. As such, the ensuing complaint is that Wilson has just traded one bit of ideology for another (or several).

Whether that complaint has force ultimately depends upon how we're supposed to individuate ideology. Couldn't Wilson respond, after all, that she's just countenancing *one* kind of determinable that can *exhibit* under-determination, over-determination, or neither – supplanting the orthodox conception - rather than three distinct kinds, and so incurring no net ideological cost? After all, we don't usually consider the set-membership relation to be a disjunctive kind just because sets can be empty, singleton, or non-singleton – we think it's the same set-membership relation in each case. Why think the determinable-determinate relation any different? That is, why can't we view the proposal as positing a *unique* bit of ideology that's variably polyadic in the required way?

This seems correct, but ultimately it allows us to refine the objection. The concern, now, is not with the number of relations that are countenanced, but instead with the range of possible configurations of any such relation permitted by its posited variable polyadicity. The account has, in effect, multiplied the number of possible states of any such relation by allowing that any instance might be non-total (*viz*, that a determinable may admit no determinates) and non-functional (*viz*, that a determinable may admit multiple determinates). Whether or not that counts as an 'ideological' cost, it certainly increases the complexity of the ensuing theory of properties, and thereby increases the explanatory burdens of such an account. More importantly, it allows us to better address the relative merits of primitivist conceptions of MI with that here countenanced. The

is, rather, bespoke – and given that it isn't utilised to explain anything else, and seems itself to call out for elucidation, it hasn't in any way reduced our stock of explananda.

primitivist, in effect, multiplies either possibilities (type-1 or 2 species) or accuracy statuses (type-3), to include an additional variety: a primitive variety. But isn't that exactly what Wilson does too, with respect to the determination relation? The primitivist opponent (Barnes and Williams (2010)) of Wilson's account does, sure enough, make such modifications to the *actualisation* relation, but it's unclear why that would be any more a problematic modification than Wilson's amending of the determination relation. They aren't - to follow the thought above - countenancing a novel kind of actualisation relation. The general complain, here, is that it's far from clear that there is a difference in ideological cost between countenancing either a gappy, glutty, or primitive conception of indeterminacy: each seemingly supplements the 'simple' conception of some relation or other.

The above concerns the first reductive aspect of Wilson's view distinguished above: that it involves as non-primitive flavor of indeterminacy. What of the second? The thought here may be that Wilson in effect allows us to explain *why* instances of metaphysical indeterminacy occur, by appeal to just bog-standard facts about property instantiation (however unpacked). While it warrants emphasis that we're here considering the *nature* of metaphysical indeterminacy rather than its source, it nevertheless would count in Wilson's favour if her account of indeterminacy's nature allowed a more parsimonious conception of its source. The thought, here, is that while instances of indeterminacy, on her account, can be explained as holding in virtue of straightforward facts about property instantiation, the primitivist can give no explanation: they're primitivists. This is mistaken. First, as I stated in chapter 1, primitivist accounts of its nature may well be paired with non-primitive accounts of its 'source'. Second, the suggestion involves a mischaracterization of Wilson's theory: the view is not that indeterminacy occurs *in virtue of* the instantiation of a determinable without a determinate (or with many), but

rather is *identical* to such a state of affairs. Indeed, insofar as the relevant property instantiations themselves require explanation, then it's unobvious why the nature-primitivist of metaphysical indeterminacy couldn't appeal to those *same* facts to ground instances of *primitive* indeterminacy. Alternatively, if their instantiation is fundamental, then the primitivist doesn't seem any worse off.

As such, it's far from clear how Wilson's account is meant to score a parsimony advantage over the primitivist in respect of either reductive component.²¹⁰ Parsimony aside, then, another reason to value a reduction might be that, insofar as one utilises familiar resources in the reductive base, the reduction can help make intelligible the (less familiar) reduced phenomenon. So understood, the claim collapses into the second alleged virtue: familiarity.

3.3.2 Familiarity

In appealing to the familiar devices of determinables and determinates, Wilson claims that the account scores better than its rivals in terms of the ensuing intelligibility of metaphysical indeterminacy. Why value this? One thought may be that the view offers a more powerful means of responding to the sceptic who charges metaphysical indeterminacy with incoherence. However, given the anti-sceptical account in chapter 1, I see no decisive advantage here. Moreover, it seems entirely proper to me that it is precisely there – in the furnishing of a pre-theoretical concept – that

²¹⁰ Moreover, the second reductivist element of the theory may even render it *less* ontologically parsimonious than primitivism, due to the need for fundamental determinables. Sure, the primitivist about metaphysical indeterminacy *might* be independently committed to fundamental determinables (if Wilson's arguments are correct), but that is no commitment of her theory of metaphysical indeterminacy *per se*. It is, by contrast, an explicit commitment of Wilson's account. As such, the theory is not only suspiciously non-neutral on this substantive ontological issue, but it is also hostage – on pain of a parsimony cost relative to, say, primitive theories – to the success of Wilson's arguments for fundamental determinables.

the response to the sceptic should be appropriately endeavoured. The sceptic's objection to the primitivist, after all, would *not* be that they don't understand the notion of a primitive – thus, their objection is not with the primitivist's substantive conception of metaphysical indeterminacy's nature. Their objection, rather, is either that there is no phenomenon to be captured by a theory of metaphysical indeterminacy, or that the phenomenon so isolated isn't properly labelled 'metaphysical indeterminacy' – and the familiarity of the machinery employed in such a theory wouldn't offer any retort to either such claim. As such, the supposed familiarity advantage, so construed, misapprehends the sceptical threat.

The sceptic aside, perhaps there's some cognitive value to the alleged increase in intelligibility. Such cognitive-value must – if it's to be distinct from the sceptical challenge concerning the putative phenomenon – must concern the comprehensibility of the theory itself. However, it's unclear that there's any meaningful threat to primitivism here: after all, the account suggests that there's *nothing* that can be said about the nature of indeterminacy much beyond its character and its explanatory-role, and it's hard to see how such could be the subject of incomprehensibility – nothing positive is said to fail to comprehend. Moreover, it is ultimately unconvincing that Wilson is at any advantage, given her appeal to an unorthodox conception of determinables and determinates. Insofar as our pre-theoretic, intuitive conception of determinables and determinates is the orthodox one – i.e. that which doesn't permit under-/over-determination – then the account cannot piggyback on *that* conception in order to make claims about the account's intelligibility. As such, it is unclear that the unorthodox conception won't be met with just as much incredulity as primitivist accounts of metaphysical indeterminacy.

As such, in respects of either satisfying the sceptic or enabling intelligibility, the account lacks any clear advantage in respects of familiarity.

3.3.3 Systematicity

What of the systematicity claim - the claim that the account can give a systematic account of various phenomena that seem, intuitively, to exemplify metaphysical indeterminacy. Insofar as a unified account of these phenomena is desirable, this would certainly seem to be an attractive feature of the account. But, it is far from clear that this is a decisive *advantage* over rival theories in lieu of arguments to establish that those theories cannot explain all of the intuitive data.²¹¹ Moreover, this aside, it is dubious whether the account really can satisfactorily handle the cases that Wilson claims it can, at least without significant ontological cost. She discusses three intuitive examples: quantum indeterminacy, the open future, and problem-of-the-many-style indeterminate boundaries. The latter two present difficulties for the theory, and thereby undermine the alleged systematicity claim.

All of the cases, especially those concerning the open future, seem quite a long way from the motivating scientific examples of determinables which Wilson relies on. Consider the open future: what is the postulated determinable supposed to be in such cases? They must be much broader than [The future is somehow sea-battle-wise], but much narrower than [The future is some way]. Why does this matter? Well, recall, it is

²¹¹ Wilson does indicate her misgivings about the adequacy of alternative 'meta-level' (type 3) theories. First, she alleges that Barnes & Cameron's (2009) application to the open future has certain shortcomings. I find her reasoning unpersuasive, but I can't discuss this extensively here. Second, she might utilise her repeated claim that 'meta-level' views violate certain intuitions about these cases, which undermines their claim to have properly handled those cases: that systematicity is paid for by rejecting part of what, intuitively, requires explanation. I'll discuss this complaint in the next section.

essential for Wilson's view that there be *fundamental* determinables that we can appeal to. However, part of Wilson's defence of the claim that determinables can be fundamental consists in their being non-gerrymandered – or, at least, less gerrymandered than any Boolean construction out of the determinates of a given determinable. Now, 'gerrymandered' gets thrown around a lot, and I'll admit I find it pretty obscure. However, I think we can say something more precise about determinables: in particular, that co-determinates (i.e. determinates under a common determinable) are all such that they share the respects which determine their instantiation. Colours, for instance, are such that they are all instantiated in virtue of an entities being a particular hue, shade, and brightness – these features exclusively and exhaustively determine which determinate is instantiated. It is for this reason, it seems, why Blue and Triangle aren't co-determinates – and, consequently, we might thereby judge that any hypothesised determinable covering Blue-ness and Triangle-ness would be too gerrymandered. So, what of our hypothesised determinable in the open future case? Well this too looks implausibly gerrymandered: the respects that determine the occurrence of a sea battle look quite different from the respects that determine the spontaneous combustion of the worlds sailors.

Consequently, it looks implausible to claim that open future cases could be diagnosed as this approach mandates. Perhaps there is a suitable surrogate one might find – for instance, one might appeal to fundamental Boolean constructions. However, the limitations of this are clear. First, one would – were one to only do this for open future cases – thereby be abandoning hope of a unified, systematic account of putatively metaphysically indeterminacy phenomena. If one instead proposes to appeal to fundamental Boolean properties wholesale then this is, of course, tantamount to massively inflating ones ontology. Moreover, appealing to fundamental Boolean constructions smacks of ad hocery,

given that it has no independent motivation, unlike the motivating scientific examples of fundamental determinables. The obvious move is to *restrict* the accounts to cases involving such determinables, but the cost is to thereby abandon the ability of the account to handle all putative examples of metaphysical indeterminacy, and thus alleged systematicity of the account.

Moreover, there is another means to witness a considerable parsimony cost on Wilson's proposal if it is intended to be widely applied, even if such challenges to the requisite fundamentality of the determinables above is met. Even if you can stomach the ontological bloat of requiring a fundamental determinable to be instantiated for every instance of indeterminacy, there's also *ideological* profligacy given the need for a large variety of *kinds* of fundamental determinables. To see the extent of this, consider a leaf that is in the borderline region of red and orange. It is, let us suppose, nevertheless determinately *not* blue. Given this, it cannot be the case that the relevant determinable is simply 'has a colour', for that wouldn't sufficiently isolate the specific colours between which it is indeterminate. As such, the determinables must be sufficiently fine-grained to be suitably discriminating. This example generalises: it seems that, for any determinable with more than two determinates, we might want to say that there is indeterminacy in respects of only two of them. Given the account, however, such cases could only be handled by countenancing a determinable comprising only the relevant determinates as its co-determinates. As such, the intuitive extent of indeterminacy seems to require of the account a huge plurality of sufficiently fine-grained co-determination relations, and thus a bloat of fundamental determinables.

None of these parsimony concerns seem as pressing for the case of quantum mechanical indeterminacy, but this emphasises the point that

whilst the account may succeed for some cases – such as in physics – requiring relatively few fundamental determinables, in extending the approach beyond suggests systematicity is being paid for by a significant parsimony cost.

Further problems beset the accounts handling of indeterminate boundaries as cases of overdetermination. These are cases, recall, where multiple co-determinates of a determinable are instantiated.

Take the case of indeterminate boundaries first. Here, the accounts diagnosis is that Everest instantiates some determinable property of [having a macro-boundary], and multiple determinates of that boundary [B1][B2]...[Bn] – where these determinates are precise boundaries, and the determinable the property of falling within some range demarcated by those determinates.

The problems with this are two-fold. First, as stated, the proposal seems to involve the claim that Everest can have multiple precise boundaries. Now, we may invoke a fancy semantics to prevent any proposition of the form <Everest is [Bn]> from being determinately true in order to salvage intuitions, but it is nevertheless the case that Everest instantiates multiple properties which are, seemingly, incompatible. The putative boundaries of any given entity seem to be just the sorts of things that metaphysically exclude one another. Moreover, this worry seems more general, and brings the whole idea of overdetermination into question. Determinables, as I remarked earlier, seem to be such that their being non-gerrymandered consists in their corresponding determinates all sharing exclusive and exhaustive respects which determine (or at least co-vary with) their instantiation. Colour, for instance, seems non-gerrymandered because all of its determinates are united by having their instantiation governed by identical features: hue, brightness, and saturation. Correspondingly, it can be seen that all of our boundary determinates are

united in having their instantiation governed by an entity's (i.e. Everest) possession of a spatial location within certain parameters dictated by the determinable macro-boundary. Insofar as this is the case then, Wilson seems to be diagnosing indeterminate boundaries as cases of multiple location – perhaps with some semantic trickery to salvage intuitions about there not being a determinate boundary.

But, clearly, this generalises to all of the accounts diagnoses of overdetermination. Moreover, although location is the relevant feature in the case of boundaries, this isn't obviously the case for all problem of the many phenomena – and insofar as this is the case, the view will commit to a variety of multiple-location like phenomena. Of course, it may be that these mark defensible metaphysical positions, but it suffices to point out that it seems a pretty huge cost to a theory of metaphysical indeterminacy that it commit us to things like multiple location, especially if this is invoked to deal with only a subset of putatively metaphysically indeterminate phenomena. Second, even given this, once one has invoked something like multiple location to do this work, it is unclear what work fundamental determinables are doing. Even if there are cases of multiple location which we do not want to diagnose as manifesting metaphysical indeterminacy, the entities in question will plausibly instantiate the relevant determinables, unless Wilson advocates the more extreme position that an entity can instantiate a determinate without instantiating the determinable(s) it falls under. In lieu of such a radical position, fundamental determinables seem superfluous in accounting for problem of the many style cases. This evidently would undermine the claim to have given a systematic account of putatively metaphysically indeterminate phenomena, for ones diagnosis of problem of the many cases would effectively eschew that proffered by the account.

In sum, the prospects for a systematic and unified account of putatively metaphysically indeterminate phenomena by way of this account looks unpromising.²¹²

3.3.4 Intuitiveness

Wilson repeatedly claims that the account scores an advantage over 'meta-level' (type-3) rivals by securing the intuitive truth of the claim that, in cases of MI, there is 'no fact of the matter'. However, this looks mistaken. Even granting a semantics that delivers indeterminate truth-values for $\langle Fa \rangle$, one might point to the fact that, in cases of undetermination, the F is determinately not instantiated. And this, it might be thought, is contrary to the intuitions driving the thought that 'no fact of the matter' locutions are true. It needn't be, I should be clear, that one is presupposing that a correct handling of the locutions requires positing unsettledness in whether F is instantiated, just that it is neither the case that (determinately) Fa or $\neg Fa$ obtains. One doesn't have to subscribe to unsettledness to respect this thought – Greenough can deliver this result too with truthmaker-maximalist style underdetermination. If it's a concern about queerness in what obtains or what is instantiated which underpins the no fact of the matter locutions, we might allege that [DMI] – even if it delivers the truth of the locutions – fails to adequately handle the motivating concern.

²¹² I've omitted mention of Wilson's deployment of the account in handling cases of borderline predicates. This is because, unless she is willing to diagnose all cases of borderline predicates as cases of metaphysical indeterminacy, the application lends no support to its viability as a case of metaphysical indeterminacy. Moreover, even if she were to make this bold claim, the account she gives does not seem to adhere to her account at all. Instead, she suggests that borderline baldness, for instance, be understood as a gestalt phenomenon, where a borderline bald individual instantiates many determinates which differ in whether or not the invoke judgements of baldness or non-baldness in perceivers. This is unsatisfying. First, there's no need to invoke determinables to tell this sort of story, so it's hard to see how this accords with the theory. Second, it still fails to tell us how the individual stands to baldness, instead explaining away only our indecision over whether to *judge* them bald.

However, this aside, it is also dubious that [DMI]'s main rival – primitivism – cannot deliver the truth of no fact of the matter locutions. One might suggest that, while E&R might subscribe to the de dicto claim ‘there is a fact of the matter’, they deny the de re claim ‘there is no fact such that it is ‘of the matter’’. Once the de re and de dicto readings of these locutions is presented, it seems that they might adequately handle these cases by saying that the locutions are true on their de dicto readings but not on their de re readings – diagnosing a standard case of ambiguity. Unless Wilson can muster the intuition that the de dicto reading is false, this looks adequate – but these are far more fine grained intuitions than I, for one, feel confident in.

3.4 Barnes & Williams’s Primitivism

Barnes and Williams (2010) develop a type-3 primitivist view, and develop a quasi-supervaluationist logic and semantics for it on that basis, with worlds playing the role of precisifications. The following components of their view should be distinguished:

- (1) MI is type-3 primitivism;
- (2) MI’s source is primitive;
- (3) MI can be modelled as the ‘world-input’ in a semantic theory;
- (4) MI sharpenings can be modelled with ersatz worlds;
- (5) MI sharpenings can be modelled with ersatz *possible* worlds;
- (6) Truth is *s*-truth (thus bivalent)

The classicism resulting from their account derives from the claims (1)+(5)+(6)+(7) with the semantic claim (6).

A crucial aspect of the view, if it is to be genuinely of type-3, is that the

sharpenings play the possible-world role. Barnes and Williams call the set of worlds between which actuality is indeterminate the 'halo' of indeterminacy. One might suspect that sharpenings cannot play the possible-world role. Here's a bad reason for thinking that: we can make modal claims like the following (a) though actuality is determinate, it could have been indeterminate, (b) it's possible that it's indeterminate that p. Also, it seems like ordinary modal claims track *haloes*: if I say, 'is it possible to cure my baldness with this ointment?' and you say 'yes', I'm going to feel pretty deceived if the best I can achieve is borderline baldness. That suggests that what I'm after when I ask if it's possible is whether it's possible that I'm *determinately* bald. Aren't those claims treating the halo itself as a locus of modal evaluation: aren't we saying that, although this halo is actual, that other halo could have been actual? This is misguided: this is no more employing haloes in the possible-world role than is the claim that we could have been in a distinct nomological region treating that region as a world. In that case, what we're saying is that our world occupies a given nomological region, but could have been in another. Likewise, when we make modal claims superficially about haloes, those should be understood as claims about the location of actuality with respect to a halo.

Nevertheless, there is a more limited objection in this vein that can be reached by the observations of Darby (2010) and Skow (2010) concerning a problem for this view (and, indeed, for any type-3 view) in catering for quantum indeterminacy. We can set the details of the quantum case aside, because the problem is much more abstract – the fact that quantum mechanics exhibits the abstract problem merely serves to demonstrate that such cases of indeterminacy are actual (or, if one rejects the underlying interpretation of quantum mechanics on which the problem relies, at least metaphysically possible). The problem concerns an instance of indeterminacy that nevertheless is characterized by the following feature:

(1) $\Delta(p \vee q) \& \Delta(q \vee r) \& \Delta(r \vee p)$ [Assumption, from QM]

Where the disjunctions are exclusive. The problem is that this entails:

(2) $\Delta(p \vee q) \& (q \vee r) \& (r \vee p)$ [Δ -adjunction]

Which in turn entails:

(3) $(p \vee q) \& (q \vee r) \& (r \vee p)$ [Δ -factivity]

Darby and Skow present this as a problem for accounts of indeterminacy employing precisifications, because they take it to show that the relevant indeterminacy cannot be precisified. However, it is much more of a general problem than Darby and Skow make out: indeed, it's a problem beyond precisificational accounts of Δ . The problem is not just one of unsharpenability - that you can't sharpen the indeterminacy in a consistent way. It's a threat to the very logic of indeterminacy presupposed by many. Assuming (1) is possible, it means we need to either abandon Δ -adjunction or Δ -factivity.

Thankfully, the actual problem isn't so pressing: whilst the formal problem above *is* genuinely threatening, we've no reason yet to think it even merely possible. The reason is that we can deny that the troublesome disjuncts in the cases are strictly identical, but rather claim that they are nomologically covariant. This opens up the possibility that we may accommodate the case just by allowing *counter-nomological* worlds into the halo. Of course, this will mean that sharpenings can't be represented by means of the state-space formalism of Quantum Mechanics, about which we might have Scientific-Realist scruples, but let's set that aside for now. But, there's a reason to think this option isn't open to Barne's and Williams.

If Barnes and Williams *did* embrace this solution, then it would mean that all the candidate actualities were nomologically impossible. Consequently, it would be determinate that actuality is nomologically impossible. That's nuts. We might well reply to this that it misinterprets the metaphysical content of the laws: laws don't tell us which sharpenings are nomologically possible, but rather which *haloes* are - they tell us not that the *worlds* are nomologically impossible, but that any *halo* containing just one such world is.

Here the worry bites, however: this *is* divorcing the sharpenings, and *instating* haloes, as *possible* worlds. It seems core to the theoretical role of possible worlds that they are whatever plays that role in laws. If that role is being played by haloes – as it seems they must to handle this case – then the halo is being treated as a possibility in its own right. Thus, the view collapses into the 'third-possibility' view – i.e. a type-1 or type-2 view – rather than a type-3 view.

Now, this problem isn't fatal to the view – it remains the case that it *may well* be capable of handle cases without the features peculiar to this quantum case. Still, it does establish that the scope of the theory is limited: there are some putative cases of metaphysical indeterminacy that it cannot accommodate.

Summary

In this chapter I have made clear how we can make sense of metaphysical indeterminacy in a way that makes explicit its structural similarities with non-metaphysical theories of indeterminacy, exhibited the space of theories available (including several unexplored options), and critically engaged with three extant substantive theories amongst those options. The first, I claimed, required substantial commitments with regards to the truth-making relation that rendered it potentially objectionable. The second, I claimed, fails to live up to claims made in its favour, and that additionally it is particularly metaphysically costly – especially if applied to diagnose all putative cases of metaphysical indeterminacy. The third, I claimed, is incapable of handling a core putative instance of metaphysical indeterminacy without collapsing into a different view. As such, each of them has been found to face certain difficulties, but none seems especially problematic enough to render them decisively flawed. Further work remains to show whether any individual account could succeed as a unitary account, or whether we should take such results to motivate a pluralistic attitude towards the nature of metaphysical indeterminacy.

Conclusion

This thesis aimed to (a) offer a sceptic-allaying pre-theoretical characterization of metaphysical indeterminacy; (b) to provide a general model of the *nature* of indeterminacy; and (c) to utilize that model to so characterize metaphysical indeterminacy, whilst beginning to evaluate substantive proposals.

In the first chapter, I outlined the phenomena associated with indeterminacy and claimed that this could be used in stipulating a functional concept of indeterminacy. Second, I assessed various attempts at giving a pre-theoretical gloss on *metaphysical* indeterminacy, and argued that it should utilise the prior functional characterisation of indeterminacy. Third, I distinguished three questions to which '*metaphysical* indeterminacy' may be answered – source, nature, and manifestation questions – and claimed that the first two were of primary interest, and should be used to supplement the functional notion in order to give a suitably pre-theoretical conception of the explanandum capable of meeting sceptical worries about the notion.

In the second chapter, I began addressing options for analyses of the nature of indeterminacy. Therein, I developed a general model, distinguishing the crucial notions of an 'arena' of indeterminacy, and its 'flavours' and 'species'. I then illustrated the utility of these notions in distinguishing some varieties of supervenience, and by undermining two arguments for metaphysical indeterminacy from Merricks and Caie.

Finally, in the third chapter, I addressed metaphysical indeterminacy directly, showing how we could implement the model previously outlined to make sense of the options, so demonstrating some unexplored avenues. Then, I critically engaged with three such theories. I argued that each had

problems, but that none seemed fatally flawed. Such problems thus seem to present a challenge for us to find a suitable unitary account capable of avoiding these or other difficulties, or else to adopt a pluralistic account of indeterminacy's nature.

Overall, then, we can appreciate that investigation into metaphysical indeterminacy is in good standing, and should be appreciated as such by the sceptic. Moreover, we can appreciate its structural similarity to other more familiar kinds of indeterminacy, and should be cautious in light of the above distinctions about moving too quickly to establish metaphysical indeterminacy's existence. Finally, I hope to have shed some light on some of the obstacles faced by some token substantive theories, and thereby motivated further theorising into its nature.

- Akiba, Ken (2000) 'Vagueness as a modality'. *Philosophical Quarterly* (50) 359-370.
- Akiba, Ken (2004) 'Vagueness in the World'. *Noûs* (38) 407-29.
- Armstrong, D. M. (1989b) 'Universals: An Opinionated Introduction'. *Boulder, CO: Westview Press*.
- Armstrong, David (2003) 'Truth and Truthmakers'. *Cambridge: CUP*
- Azzouni, Jody (2006) 'Deflating Existential Consequence: A Case for Nominalism', *OUP: USA*.
- Barnes, Elizabeth (2005) 'Vagueness in Sparseness'. *Analysis* (65) 315-21.
- Barnes, Elizabeth (2007) 'Vagueness and Arbitrariness: Merricks on Composition'. *Mind* (116, 461) 105-13.
- Barnes, Elizabeth (2009) 'Indeterminacy, Identity, and Counterparts: Evans Reconsidered'. *Synthese* (168, 1), 81-96
- Barnes, Elizabeth (2010) 'Arguments Against Metaphysical Indeterminacy'. *Philosophy Compass* (5,11) 953-964
- Barnes, Elizabeth (2010) 'Ontic Vagueness: A Guide for the Perplexed'. *Nous* (44, 4) 607-27
- Barnes, Elizabeth (2014) 'Fundamental Indeterminacy'. *Analytic Philosophy* (55, 4) 339-362
- Barnes, Elizabeth (2013) 'Metaphysically Indeterminate Existence'. *Philosophical Studies* (166, 3) 495-510
- Barnes, Elizabeth & Williams, J.R.G. (2009) 'Vague parts and Vague Identity'. *Pacific Philosophical Quarterly* (90) 176-187

- Barnes, Elizabeth & Cameron, Ross (2009) 'The Open Future: Bivalence, Determinism, and Ontology'. *Philosophical Studies* (146,2), 291-309
- Barnes, Elizabeth & Williams, J.R.G. (2010) 'A Theory of Metaphysical Indeterminacy', in K. Bennett & D. Zimmerman (eds.), *Oxford Studies in Metaphysics* Vol. 6. *Oxford: OUP*
- Barnes, Elizabeth & Williams, J.R.G. (2010) 'Response to Eklund', in K. Bennett & D. Zimmerman (eds.), *Oxford Studies in Metaphysics* Vol. 6. *Oxford: OUP*
- Barnes, Elizabeth & Cameron, Ross (2011) 'Back to the Open Future'. *Philosophical Perspectives* (25) 1-26
- Barnett, David (2008) 'Indeterminacy and Incomplete Definitions'. *Journal of Philosophy* (105, 4) 167-191
- Barnett, David (2009) 'Is Vagueness Sui Generis'. *Australasian Journal of Philosophy* (87, 1) 5 – 34
- Benacerraf, Paul (1965) 'What Numbers Could Not Be'. *Philosophical Review* (74, 1) 47-73
- Black, Max (1937) 'Vagueness. An Exercise in Logical Analysis'. *Philosophy of Science* (4, 4) 427-455
- Buelnap, Nuel (1977) 'A useful four-valued logic', in J.M. Dunn and G. Epstein (eds.), *Modern Uses of Multiple-Valued Logic*, *Dordrecht: D. Reidel Publishing Co.*
- Bueno, Otávio & Colyvan, Mark (2012) 'Just What is Vagueness?' *Ratio* (25, 1) 19-33

- Burgess, John A. (1990) 'Vague Objects and Indefinite Identity'.
Philosophical Studies (59, 3) 263-287
- Caie, Michael (2014) 'Metasemantics and Metaphysical Indeterminacy', in
A. Burgess & B. Sherman (eds.), *Metasemantics, Oxford: OUP*
- Cameron, Ross (2007) 'The Contingency of Composition'. *Philosophical
Studies* (136, 1) 99-121
- Cameron, Ross (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
- Cameron, Ross (2013) 'Changing Truthmakers: Reply to Tallant and
Ingram'. In K. Bennett & D. Zimmerman (Eds.), *Oxford Studies in
Metaphysics* 8, *Oxford: OUP*
- Cameron, Ross (forthcoming) 'Truthmakers', in M. Glanzberg (Ed.), *The
Oxford Handbook of Truth, Oxford: OUP*
- Chalmers, David. (2009) 'Ontological Indeterminacy' In D. Chalmers, D.
Manley and R. Wasserman (eds.), *Metametaphysics*, 347–83 *Oxford: OUP*
- Colyvan, Mark (2001) 'Russell on Metaphysical Vagueness'. *Principia* (5)
87-98
- Correia, Fabrice (2006) 'Generic Essence, Objectual Essence, and Modality'
Noûs (40, 4) 753–767
- Dunn, J. Michael (1976) 'Intuitive semantics for first-degree entailment and
'coupled trees''. *Philosophical Studies*, (29) 149–168

- Darby, George (2010) 'Quantum Mechanics and Metaphysical Indeterminacy'. *Australasian Journal of Philosophy* (88, 2) 227-245.
- Dorr, Cian (2003) 'Vagueness Without Ignorance'. *Philosophical Perspectives* (17, 1) 83-113
- Dorr, Cian (2005) 'What We Disagree About When We Disagree About Ontology'. In M.E. Kalderon (ed.), *Fictionalism in Metaphysics*. Oxford: OUP
- Dummett, Michael (1975) 'Wang's Paradox', in Keefe & Smith (eds) *Vagueness: A Reader*. Cambridge: MIT Press
- Dummett, Michael (2006) 'Thought and Reality'. Oxford: OUP
- Edgington, Dorothy (2000) 'Indeterminacy De Re'. *Philosophical Topics* (28) 27-43
- Edgington, Dorothy (2010) 'Sorensen on Vagueness and Contradiction', in R. Dietz & S. Moruzzi (eds.), *Cuts and Clouds: Vagueness, its Nature, and its Logic*. Oxford: OUP
- Eklund, Matti (2005) 'What Vagueness Consists In'. *Philosophical Studies* (125, 1) 27-60.
- Eklund, Matti (2008) 'Deconstructing Ontological Vagueness:'. *Canadian Journal of Philosophy* (38, 1) 117-140
- Eklund, Matti (2010) 'Vagueness and Second-Level Indeterminacy' in R. Dietz & S. Moruzzi (eds.), *Cuts and Clouds: Vagueness, its Nature and its Logic*. Oxford: OUP

- Eklund, Matti (2011) 'Being Metaphysically Unsettled: Barnes and Williams on Metaphysical Indeterminacy and Vagueness', in K. Bennett & D. Zimmerman (eds.), *Oxford Studies in Metaphysics Vol. 6. Oxford: OUP*
- Evans, Gareth (1978) 'Can There Be Vague Objects?'. *Analysis* (38), 208
- Field, Hartry (1973) 'Theory Change and the Indeterminacy of Reference'. *Journal of Philosophy* (70) 462-81
- Field, Hartry (1994) 'Disquotational Truth and Factually Defective Discourse'. *Philosophical Review* (103, 3) 405-452
- Field, Hartry (2003) 'No fact of the matter'. *Australasian Journal of Philosophy* (81) 457-480
- Fine, Kit (1975) 'Vagueness, Truth, and Logic'. *Synthese* (30) 265-300
- van Fraassen, Bas (1966) 'Singular terms, truth-value gaps, and free logic.' *Journal of Philosophy* (63, 17) 481-95
- Fine, Kit (2006) 'The Reality of Tense'. *Synthese* (150, 3) 399 - 414
- French, Steven and Krause, Décio (2003): 'Quantum Vagueness'. *Erkenntnis* (59) 97-124.
- Greenough, Patrick (2003): 'Vagueness – A Minimal Theory'. *Mind* (112), 235-81
- Greenough, Patrick (2008) 'Indeterminate Truth', in P. French (Ed), *Truth and Its Deformities, Midwest Studies in Philosophy*, 213-241
- Greenough, Patrick (Forthcoming) 'Truthmaker Gluts', in N. Pedersen & Cory D. Wright, *Truth and pluralism, Oxford: OUP.*

- Hale, Bob & Wright, Crispin (2009) 'The Metaontology of Abstraction' In D. Chalmers, D. Manley & R. Wasserman (eds.), *Metametaphysics: New Essays on the Foundations of Ontology*. Oxford: OUP
- Haslanger, Sally & Saul, Jennifer (2006) 'Philosophical Analysis and Social Kinds'. *Proceedings of the Aristotelian Society* (106, 1) 89-118
- Hawley, Katherine: (2001) *How Things Persist*. Oxford: OUP
- (2002) 'Vagueness and Existence'. *Proceedings of the Aristotelian Society* (CII.2) 53-67
- Heller, Mark (1996) *Against Metaphysical Vagueness*. *Philosophical Perspectives* (10) 177--85
- Horgan, Terence (1994) 'Robust Vagueness and the Forced March Sorites Paradox'. *Philosophical Perspectives 8: Logic and Language* 159-88
- Hudson, Hud (2005) *The Metaphysics of Hyperspace*. Oxford: Oxford University Press.
- Hyde, Dominic (1998). *Vagueness, Ontology and Supervenience*. *The Monist* (81, 2) 297-312
- Jago, Mark (2011) 'Setting the Facts Straight'. *Journal of Philosophical Logic* (40, 1) 33-54
- Kearns, Stephen & Magidor, Ofra (2012) 'Semantic Sovereignty'. *Philosophy and Phenomenological Research* (85, 2) 322-350
- Keefe, Rosanna (2000) *Theories of Vagueness*. Cambridge: Cambridge University Press.

- Keller, Simon (2004) 'Presentism and Truthmaking'. In K. Bennett & D.W. Zimmerman (eds.), *Oxford Studies in Metaphysics 1*, Oxford: OUP
- Kroon, Frederick (2004) 'Realism and Dialetheism'. In G. Priest, J. C. Beall & B. Armour-Garb (eds.), *The Law of Non-Contradiction*. Clarendon Press
- Lange, Marc (2009) 'Laws and Lawmakers: Science, Metaphysics, and the Laws of Nature'. Oxford: OUP
- Lewis, David (1970) 'General Semantics' *Synthese* (22,1-2) 18--67.
- Lewis, David (1993) 'Many but Almost One'. In K. Campbell, J. Bacon & L. Reinhardt (eds.), *Ontology, Causality and Mind: Essays on the Philosophy of D. M. Armstrong*, Cambridge: CUP
- Lewis, David (1999) 'Papers in Metaphysics and Epistemology'. Cambridge: CUP
- López de Sa, Dan (2006) 'Is 'Everything' Precise?'. *Dialectica* 60 (4):397–409
- López de Sa, Dan (2013) 'Vagueness as Semantic Indecision: Metaphysical Vagueness vs Indeterminate Reference'. *Metaphysica* (14) 197-209
- López de Sa, Dan (2014) 'Lewis vs Lewis on the Problem of the Many'. *Synthese* (191) 1105-1117
- López de Sa, Dan (2014) 'What Could Vague Objects Possibly Be?', in K. Akiba & A. Abasnezhad (eds.), *Vague Objects and Vague Identity*, Springer
- Lowe, E.J. (1994) 'Vague Identity and Quantum Indeterminacy'. *Analysis* (54, 2) 110 - 114

- Mares, Edwin D (2004) 'Semantic Dialetheism'. In G. Priest, J. C. Beall & B. Armour-Garb (eds.), *The Law of Non-Contradiction*. Clarendon Press
- Markosian, Ned (1998) 'Brutal Composition'. *Philosophical Studies* (92, 3) 211-249
- McGee, Vann and McLaughlin, Brian (1995) 'Distinctions Without a Difference' *Southern Journal of Philosophy* (33) 203-51
- McGee, Vann and McLaughlin, Brian (2000) 'The Lessons of the Many'. *Philosophical Topics* (28) 129-51
- Mehlberg, Henry (1958) 'The Reach of Science'. *Toronto: University of Toronto Press*.
- Merricks, Trenton (2001) 'Varieties of vagueness'. *Philosophy and Phenomenological Research* (62) 145-57
- Morreau, Michael (2002) 'What Vague Objects Are Like'. *Journal of Philosophy* (99, 7) 333-361
- Mill, John Stuart (1865) 'An Examination of Sir William Hamilton's Philosophy'. In J. M. Robson (ed.), *Collected Works of John Stuart Mill*, Toronto: University of Toronto Press
- Miller, Kristie (2009) 'Defending Contingentism in Metaphysics'. *Dialectica* (63, 1) 23-49
- Milne, Peter (2005) 'Not Every Truth has a Truthmaker'. *Analysis* (65, 3) 221-224
- Parsons, Josh (1999) 'There is no truthmaker argument against nominalism'. *Australasian Journal of Philosophy* (77, 3) 325-334

- Parsons, Terence (2000) 'Indeterminate Identity: Metaphysics and Semantics'. *Oxford: OUP*
- Parsons, Terence & Woodruff, Peter (1995) 'Worldly Indeterminacy of Identity'. *Proceedings of the Aristotelian Society* (95) 171-191.
- Priest, Graham (1987): *In Contradiction*. Dordrecht: Martinus Nijhoff.
- Prior, Arthur N. (1968) *Papers on Time and Tense*, *Oxford: OUP*
- Przełęcki, Marian (1969) 'The Logic of Empirical Theories'. *London, Routledge & K. Paul*
- Quine, W.V., (1948) 'On what there is,' *Review of Metaphysics* (2) reprinted in W.V. Quine, *From a Logical Point of View*, *Cambridge: HUP*
- Quine, W.V. (1960) 'Word and Object'. *Cambridge: M.I.T. Press*
- Rayo, Agustín (2010) 'A Metasemantic Account of Vagueness', in R. Dietz & S. Moruzzi (eds.), *Cuts and Clouds: Vagueness, its Nature, and its Logic*. *Oxford: OUP*
- Rayo, Agustín (2013) 'The Construction of Logical Space'. *Oxford: OUP*
- Read, Stephen (2000) 'Truthmakers and the Disjunction Thesis'. *Mind* (109, 432) 67-80
- Rescher, Nicholas & Brandom, Robert (1980) 'The Logic of Inconsistency'. *Basil Blackwell*
- Rodriguez-Pereyra, Gonzalo (2005) "Why Truthmakers?" In H. Beebe & J. Dodd (eds.), *Truthmakers: The Contemporary Debate*, *Oxford: Clarendon Press*

- Rosen, Gideon and Smith, Nick (2004) 'Worldly Indeterminacy: A Rough Guide' in F. Jackson and G. Priest (eds) *Lewisian Themes*. Oxford: OUP
- Russell, Bertrand (1923) 'Vagueness'. in *Collected Papers*, vol. 9 147 – 54
- Ryle, Gilbert (1949) 'The Concept of Mind'. London: Penguin Books (2000 edition)
- Sainsbury, Mark (1986) 'Degrees of Belief and Degrees of Truth'. *Philosophical Papers* (15, 2-3) 97-106
- Sainsbury, Mark (1994) 'Why the World Cannot be Vague'. *Southern Journal of Philosophy* (33), 63-82
- Sainsbury, Mark (1995) 'Why the World Cannot Be Vague'. *Southern Journal of Philosophy* (33, 1) 63-81
- Schaffer, Jonathan (2009) 'On What Grounds What'. In D. Chalmers, D. Manley and R. Wasserman (eds.), *Metametaphysics*, 347–83 Oxford: OUP
- Sider, Ted & Braun, David (2007) 'Vague, So Untrue'. *Noûs* (41, 2) 133 - 156
- Soames, Scott (1999) 'Understanding Truth'. Oxford: OUP
- Skow, Bradford (2010) 'Deep Metaphysical Indeterminacy' *Philosophical Quarterly* (60, 241) 851-858
- Smith, Nicholas J.J. (2008) 'Why Sense Cannot be Made of Vague Identity'. *Nous* (42, 1) 1–16
- Smith, Nicholas J.J. (2008) 'Vagueness and Degrees of Truth'. Oxford: Oxford University Press
- Sorensen, Roy (1988) 'Blindspots'. Oxford: Clarendon Press.
- Sorensen, Roy (2001) 'Vagueness and Contradiction'. New York: OUP.

- Tallant, Jonathan (2010) 'Still Cheating, Still Prospering'. *Analysis* (70, 3) 502-506
- Tallant, Jonathan & Ingram, David (2012) 'Presentism and Distributional Properties'. In K. Bennett & D. Zimmerman (Eds.), *Oxford Studies in Metaphysics* 7, Oxford: OUP
- Tappenden, Jamie (1993) 'The Liar and Sorites Paradoxes: Toward a Unified Treatment'. *Journal of Philosophy* (60, 11) 551-577
- Thomason, Richard (1970) 'Indeterminist Time and Truth-Value Gaps'. *Theoria* (36, 3) 264-281
- Tye, Michael (1990) 'Vague Objects' *Mind* (99) 535-57
- Tye, Michael (2000) 'Vagueness and Reality'. *Philosophical Topics* (28, 1) 195-210
- Unger, Peter (1980) 'The Problem of the Many'. *Midwest Studies in Philosophy* (5) 411-67
- Van Inwagen, Peter (1990): *Material Beings*. Ithaca, NY: Cornell University Press.
- Varzi, Achille C. (2007) 'Supervaluationism and Its Logics'. *Mind* (116, 463) 633-675
- Williams, J. R. G. (2008) 'Multiple actualities and ontically vague identity' *Philosophical Quarterly* (58, 230) 134-154
- Williams, J. R. G. (2011) 'Degree Supervaluational Logic', *The Review of Symbolic Logic* (4, 1) 130-149

- Williams, J.R.G. (2012) 'Indeterminacy and Normative Silence'. *Analysis* (72, 2) 217-225
- Williams, J.R.G. (2012) 'Vagueness and Degrees of Truth, by Nicholas J. J. Smith.' *Mind* (120, 480) 1297-1305
- Williamson, Timothy (1994) 'Vagueness'. *London: Routledge*
- Williamson, Timothy (2003) 'Vagueness in Reality'. In M.J. Loux & D.W. Zimmerman (eds.) *The Oxford Handbook of Metaphysics, Oxford: OUP*
- Wilson, Jessica (2012) 'Fundamental Determinables'. *Philosophers' Imprint* (12, 4) 1-17
- Wilson, Jessica (2013) 'A Determinable-Based Account of Metaphysical Indeterminacy'. *Inquiry* (56, 4) 359-385
- Wright, Crispin (1987) 'Further Reflections on the Sorites Paradox'. *Philosophical Topics* (15, 1) 227-290
- Yablo, Stephen, (2009) 'Must Existence-Questions Have Answers?', In D. Chalmers, D. Manley and R. Wasserman (eds.), *Metametaphysics*, 347-83
Oxford: OUP
- Zadeh, Lofti (1975) 'Fuzzy logic and approximate reasoning', *Synthese* (30) 407-428
- Zemach, Eddy M. (1991) 'Vague Objects'. *Noûs* (25, 3) 323-340