



Deflationary representation, inference, and practice



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ARTICLE INFO

Article history:

Received 6 March 2014

Received in revised form

7 November 2014

Available online 23 December 2014

Keywords:

Deflationary representation;

Models and idealization;

Deflationary accounts;

Theories of truth;

Inference

ABSTRACT

This paper defends the deflationary character of two recent views regarding scientific representation, namely RIG Hughes' DDI model and the inferential conception. It is first argued that these views' deflationism is akin to the homonymous position in discussions regarding the nature of truth. There, we are invited to consider the platitudes that the predicate "true" obeys at the level of practice, disregarding any deeper, or more substantive, account of its nature. More generally, for any concept X, a deflationary approach is then defined in opposition to a substantive approach, where a substantive approach to X is an analysis of X in terms of some property P, or relation R, accounting for and explaining the standard use of X. It then becomes possible to characterize a deflationary view of scientific representation in three distinct senses, namely: a "no-theory" view, a "minimalist" view, and a "use-based" view—in line with three standard deflationary responses in the philosophical literature on truth. It is then argued that both the DDI model and the inferential conception may be suitably understood in any of these three different senses. The application of these deflationary 'hermeneutics' moreover yields significant improvements on the DDI model, which bring it closer to the inferential conception. It is finally argued that what these approaches have in common—the key to any deflationary account of scientific representation—is the denial that scientific representation may be ultimately reduced to any substantive explanatory property of sources, or targets, or their relations.

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When citing this paper, please use the full journal title *Studies in History and Philosophy of Science*

1. Scientific representation: the state of play

'Science represents through its models—and this representational aim is characteristic, or defining, of its model-building activity'. As stated—in this minimal and restricted sense—this is as uncontroversial a claim as one may encounter in contemporary philosophy of science. But what is it that science represents, and how does it do it? These are much harder questions, and there is

intense debate nowadays amongst philosophers regarding how best to address them.¹

¹ There have also been claims to the effect that these questions are themselves irrelevant and/or ill posed. For instance, Callender and Cohen (2006) argue that the notion of representation that plays a role in the sciences is essentially the Gricean one discussed in philosophy of mind, and there are no particular issues to be broached in the scientific context. There is no space to deal with this view here—although it is an interesting question whether the view genuinely bypasses the present debate, or rather reduces to some form of deflationism (in analogy with redundancy theories of truth, as discussed later on in the text). At any rate the term "representation" and its cognates such as "model" do appear prominently in the scientific literature, so there is *prima facie* a legitimate philosophical question to address regarding its nature and/or function in science.

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The various attempts to answer these questions can be distinguished in a number of different ways. In this paper I focus on one particular distinction between what I call ‘substantive’ and ‘deflationary’ accounts of representation. The former type claims that representation is some substantive or objective property or relation; the latter, by contrast, ‘deflates’ the notion of representation by claiming that there is no substantive property or relation at stake. These terms will be defined more fully below. Substantive accounts have traditionally been, implicitly if not explicitly, the norm in much of the discussion of scientific representation. Bas van Fraassen and Ronald Giere have often been thought to defend substantive analyses of representation (as isomorphism and similarity, respectively), although their views turn out to be in fact more subtle than has been supposed—and, in particular, their most recent and considered views are decisively deflationary (Giere, 2004; Van Fraassen, 2008). More recently, champions of substantive accounts include Pincock (2012), who defends structural isomorphism, and Weisberg (2013), who defends similarity; yet other attempts at substantive accounts include Bartels (2006), who defends homomorphism, French (2003) and his disciples, who defend partial isomorphism, and Contessa (2007), who defends a substantive version of the inferential conception. In all these cases the ostensive aim is to analyse away representation in virtue of some other relation or property, or set of relations and properties, that provide its reductive base.

In other words, these accounts are both *substantive* and *reductive*. It is worth noting that it is not the case that, for any concept X, a substantive account of it should be reductive. It is important in particular to distinguish ‘primitivist’ accounts from what I will in the paper consider strictly ‘deflationary’ accounts: they are by no means the same. True, a ‘primitivist’ account about a concept X starts from the recognition that X may not be reduced or analysed away. But this is because, for a primitivist, X is substantive yet unanalysable. On such a view X is an explanatory primitive property or relation that bears no reduction to any other concept or set of concepts Y. For illustration it is instructive to consider the case of laws, causation, or time. A primitivist about these concepts claims them to be explanatory primitives. For instance, David Armstrong is widely held to defend primitivism about laws; and Tim Maudlin is a primitivist about (the passage of) time. Wesley Salmon may have been a primitivist about causal processes, etc. By contrast, a Humean considers all these concepts to have a problematic status calling for analysis in terms of other concepts that he or she considers to be unproblematic. The unproblematic concepts from the Humean point of view are empirically accessible—thus laws are to be reduced to regularities; causation is to be reduced to probability, typically understood as frequency; and time is to be reduced to open conjunctive forks, or oriented correlations. None of these views is deflationary in the sense that I will develop in this paper.

Another striking example of the distinction that I am appealing to here can be found in debates surrounding the nature of knowledge. Many philosophers have attempted to analyse ‘knowledge’ away in terms of notions they regard to be self-explanatory, or at least less obscure, such as justification, truth, and belief. Yet others have resisted any such analysis, claiming instead that knowledge is an explanatory primitive that requires no analysis (notably Williamson, 2000). Along the same lines, a primitivist about representation claims that representation is an explanatory primitive which bears no further reduction. It should thus be clear that this view is a non-reductive kind of substantive account—certainly not an analysis—and should be distinguished from both the deflationary

and the reductive kind of substantive accounts that will be discussed here.²

Deflationary views or accounts of scientific representation are inaugurated by Hughes (1997), include explicitly Suárez (2004) and Van Fraassen (2008) and—on the version of deflationism defended here—implicitly Giere (2004) and Elgin (2009). On such views, representation is not a substantive property or relation. Some of these deflationary views take it to be no property or relation at all; others take it to be a property or relation, but not a substantive one—in some precise sense to be specified. Deflationary accounts are not typically reductionist—indeed it would be strange to first claim that representation is not a substantive property, or no property at all, and then go on to attempt to analyse it away anyway. (But note that the difficulty here is not logical or conceptual, but a pragmatic difficulty concerning the possible use of a reductive deflationism—for if X already fails to be, or to correspond to, a substantive property or relation then what cognitive gain could there be in reducing it to further deflationary properties or relations?) All the deflationary accounts of representation reviewed here (including ‘used-based’ accounts) are non-reductive in the weaker sense that they either do not provide an analysis in terms of necessary and sufficient conditions, or if they do provide such conditions, they claim them to have no explanatory purchase. Hence, the deflationary accounts reviewed here give up on the aim to provide an explanatory reduction of representation in terms of properties or relations between sources and targets, and this is what distinguishes them from reductive substantive accounts.

A critical issue for the purposes of this paper concerns the relationship between representation and model-building practice. In a substantive account this relation is contingent: if modellers’ practice is appropriate and effective it will latch on the relevant features of representation, but there is no logical or conceptual necessity for this to be so—the practice may in principle be fundamentally misguided. It is first the case that at the individual level, modellers can be better or worse at grasping the select set of features of a source that holds the representational relation R to the target. While collectively, there is nothing to guarantee that the practice is in any way geared towards a successful appraisal of the features and relations in question. In other words scientific practice may be more or less proficient in getting at genuine representational relations. At best, we can take scientific practice to provide some defeasible evidence for or against particular substantive accounts, and this only if we accept that our account of representation should aim to be descriptive, or explanatory, of the actual practice.³ In other words, if representation is a substantive relation, or property, then the practice of model-building provides at best an empirical benchmark to judge how appropriate the different accounts of this substantive relation are. But the practice and the account may in principle—i.e. logically or conceptually—differ markedly.

By contrast, I argue in this paper, one thing that all deflationary accounts have in common is that the agreement between representation and model-building practice is, if not a priori, at least conceptually much tighter—for it turns out that on these accounts representation cannot be contradicted by the norms that inform that practice, or be explicitly at variance with them. On some deflationary accounts this is because there is nothing that the

² I will therefore ignore the ‘primitivism’ option in the rest of the paper, reserving the term “substantive” for those accounts that are both substantive and reductive in the ways described.

³ Both Pincock and Weisberg accept this descriptive requirement, and there is no doubt that it may be best for a substantive account of representation to dovetail with representational practice; my point is that there is nothing in substantialism per se that *conceptually* or *logically* requires any degree of fit.

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