**Modal Structure and Sellars’ Metaphysical Methodology**

**Catherine Legg (Deakin University) and Aiden Meyer (Deakin University)**

1. **Introduction**

Wilfrid Sellars’ distinctive mid-20th century version of scientific realism has lately been gaining ground. There has been growing appreciation of how, by means of his critique of the Myth of the Given, Sellars highlights profound problems in the *representationalism* (or *descriptivism* – we treat these terms as equivalent) that mainstream realisms have taken for granted. Representationalism may be broadly understood as the idea that statements count as true exactly insofar as corresponding discrete portions of reality (‘truth-makers’) exist.[[1]](#footnote-1) The problem Sellars saw with representationalist realisms is that although they posit the existence of many entities, they leave unexplained: i) how our language manages to ‘denote’ these entities, when it would appear that linguistic and worldly items are quite unlike one another, ii) how the worldly items (both particulars and general properties) are individuated. With synoptic ambition rare in his era, Sellars set out to extract the tangled hedge of representationalism by its root, and develop a new, properly naturalistic, account of concept-formation in its place.

A crucial issue is how Sellarsian scientific realism can or should theorize *modality*. We shall argue that many interesting questions in this area transcend the usual ‘first-order’ concerns: “Is there an objectivist modal ontology?” and “What modal entities should we posit”? Rather, Sellars invites us to take a fresh look at the relationship between logic and metaphysics through an investigation of ‘second-order’ philosophical categories which are non-representational in a sense we shall explain. Although this investigation might seem old-fashioned by today’s lights, we shall argue that it stimulates a more conscious and fruitful examination of our role and methods *as philosophers* in the modal arena. Moreover, the notion of metaphysics as a ‘second-order’ activity has recently gained renewed attention in contemporary philosophy of science through the work of Wallace (2022; 2024a; 2024b). An exploration of Sellars’ potential contribution to these discussions is also of significant interest, especially as it remains unclear how modality is to be understood in Wallace’s approach.

Sellars is generally understood to hold a *modal non-descriptivism* (Brandom 2015; Thomasson; 2020), which understands modal properties and relations to consist not in features of the world, but merely of our representations of it. This seems evident in well-known comments such as,“the language of modality is . . . a ‘transposed’ language of norms.” (Sellars 1953:280). Brandom has been an important shaper of this reading of Sellars, but not the only one. Recently, Amie Thomasson has developed a systematic account of a Sellarsian modal non-descriptivism which she calls *modal normativism* (Thomasson 2007; 2020a). This view holds that modal claims consist in nothing but “constitutive semantic rules” transposed into object language and indicative mood. Yet the past few years have brought some valuable reexaminations of Sellars’ writings on modality, such as Heyndels (2024), which show, to the surprise of many, Sellars apparently exploring realist possible worlds semantics.

Below we build on this recent Sellars scholarship, adding a perspective from contemporary philosophy of science (Ladyman and Ross 2007; French 2014; Wallace 2022) which, we argue, throws helpful light on the connection between Sellars’ metaphysics and contemporary structural realisms. We explore a certain enigmatic claim made by Sellars, that his possible worlds semantics should not be regarded as itself a theory, but rather a “naïve realist” promissory note (Sellars 1948:313). We claim that, in his extended critique of representationalism, Sellars is not, as generally believed, taking a stand against metaphysics, or replacing semantics with a *sui generis* pragmatics, for important domains of discourse such as modality. Rather, he is taking a stand against what he called the Myth of the Categorical Given, one form of which consists in simply reading a philosophical categorial structure off the grammatical structure of manifest image discourse. Such a ‘philosophical short-cut’ problematically forecloses the possibility of science-inspired *revisionary recategorisations* of our manifest image categorial framework. In other words, it fails to investigate the *logic* of an area scientifically, a failing which is particularly egregious in the modal case.

1. **Contemporary Analytic Realist Modal Metaphysics**

Contemporary analytic philosophy hosts numerous theories of modal metaphysics, but interestingly, this was not always so. Early analytic philosophy exhibited a disdain of metaphysics which had strong roots in the Humean empiricism embraced by Bertrand Russell and the Vienna Circle. This led many early analytic philosophers to disdain modality itself. Notably, W.V.O. Quine ‘bet the farm’ on the expressive resources of extensional first-order quantificational logic being sufficient to model scientific inquiry, and thus all genuine knowledge (1966). In the last 60 years, though, analytic philosophy has more than made up for its initial metaphysics-avoidance through its so-called ‘modal revolution’. Although this revolution has roots in Carnap’s explication of a *state-description*, it was ignited when Saul Kripke (following preparatory work by Ruth Barcan Marcus) provided a completeness proof for a model theory for modal logic which replaced state descriptions with *frames*, each consisting in a set of *possible worlds* *W* and a binary *accessibility relation* *R* over them. Kripke showed how mathematical features of possible *R*s, such as symmetry, reflexivity and transitivity, neatly modelled existing modal logics such as **S4** and **S5**.

But what *are* possible worlds, metaphysically speaking? Lewis (1986:2) gifted analytic metaphysicians a straightforward representationalist answer by boldly theorizing them as concrete particulars. In his famous example, to say that it is possible that donkeys might talk is just to say that there is a possible world where talking donkeys *exist*. Thus, actuality is indexical – the actual world is simply the one *we* happen to inhabit (Lewis 1986:92-3). Of course, Lewis (1986:2) is forced to posit that his concrete worlds are all spatio-temporally and causally isolated from one another, in order to individuate them, and this raises profound epistemological questions regarding the existence and nature of entities so entirely disconnected from us (Lewis 1986:115-123). Lewis nevertheless feels justified in postulating his worlds as truth-makers for modal talk that seems manifestly true. Because we would all agree that “[t]here are ever so many ways that a world might be”, he argues, it makes sense to say that “[there are] other worlds that are other ways” (Lewis 1986:2). Thus, Lewis’ general methodological approach risks falling into the Myth of the Categorical Given, insofar as he reads his ontology straight from the grammatical structure of manifest image discourse.[[2]](#footnote-2) We will also find it useful to describe Lewis’ plurality of worlds as an *external ontology*, insofar as he assumes that his metaphysical concepts ‘cut reality at its joints’ in the manner of scientific terms, so that the only difference between theorizing in physics and metaphysics is that the latter has more general ontological scope.[[3]](#footnote-3)

This same externalism is seen in Lewis’ metaphysics of *Humean Supervenience* whereby “all there is…is a vast mosaic of local matters of fact, just one little thing and then another” (Lewis 1986:x). This claim assumes standard modern-day Humean denials of real modal connections in nature, regarding modal claims as reducible to statements describing regularities in a distribution of concrete particulars.[[4]](#footnote-4) This rejection of necessary connections, in turn, underpins Lewis’ (1986:87–88) *recombination principle*, whereby any component of any possible world can coexist (or not) with any other component of that or any other possible world. This principle is key to constructing his plenitude of possible worlds.

In some important ways it is useful to consider Lewis as representative of certain trends in contemporary analytic metaphysics. Although the stark simplicity of his posited modal concreta has been considered idiosyncratic (to the point of meriting an ‘incredulous stare’), his contemporary rivals largely assent to his fundamental representationalist assumption that an objective account of modality must locate truth-makers of some kind. For instance, a coalition of ‘actualists’ have sought to soften the counterintuitive dimensions of Lewis’ view by holding that a possible world, though existent, constitutes some form of *abstract object*, whether it be comprised of propositions (Adams 1974), properties (Stalnaker 1976), or states of affairs (Plantinga 1979).[[5]](#footnote-5) Similarly, attempts to understand modal knowledge in terms of dispositions (Vetter 2015), or via “*a priori* access to essentialist facts that ground the modal truths” (a view (Tahko 2015:232) attributes to Lowe), take essences and/or dispositions to be fundamental, existent, modal categories. Although much has been made of a profound philosophical debate between these actualisms and Lewis’ possibilism, all essentially tread the same ground of first-order ontologizing.

As this contemporary modal metaphysics research programme grows ever more elaborate, it comes into increasing contact with areas of physics which also aim to theorize the most fundamental aspects of reality. Its methodological reliance on ‘intuition’ has arguably led to some unfortunate claims.[[6]](#footnote-6) But what is the alternative to ‘armchair modal metaphysics’? One might heed Ladyman and Ross’ (2007:vii) general call for analytic metaphysics to “be discontinued”. But we believe this would be a grave mistake. As philosophers, it leaves our role and ambitions reduced to simply learning retrospectively what first-order theorizing has been performed by scientists, and perhaps some ‘hedge-trimming’ in knowledge’s under-story.We believe that this is to prematurely abandon genuine *second-order* contributions that we philosophers can make to metaphysics, with the right combination of *confidence in our own methods, and sufficiently informed concert with natural scientists*. Our account of such contributions will occupy the rest of the paper.

First, in §3, we introduce the currently accepted picture of Sellars’ account of modality, and its affinities with Thomasson’s modal normativism. Then, in §4, we contrast this picture with Sellars’ (1948’s) widely overlooked possible worlds approach to modality, which we shall analyse as a form of modal structuralism. We shall also explore how Sellars treats this analysis as a “naive realist” preliminary experiment, rather than a final theory. In §5, we present our understanding of a Sellarsian non-naive methodology that avoids the pitfalls of standard representational metaphysics. Here we show how Sellars understands categorial concepts as second-order functional classifications of first-order scientific frameworks that may be understood to ‘picture’ a reality. In §6, we discuss affinities between this account of philosophical categories and Wallace’s (2022) *math-first realism*, which treats metaphysics as providing a second-order predicate precisification of first-order scientific theories. We show how Wallace’s work enables a Sellarsian metaphysics to accommodate the prospect that first-order scientific reality-mapping is *mathematical, not conceptual*. In §7, we compare Sellars’ modal structuralism to contemporary ontic structural realist views on modality, which leads us to explore the comparative advantages that Sellars’ structuralism holds over Lewisian (and other contemporary analytic) entity-based modal realisms in §8. In §9, we return to Thomasson, using our new account to argue that her “easy ontology” (2007; 2014; 2022b) falls into the Myth of the Categorial Given, creating a risk of premature metaphysical results. Ultimately, we argue that Sellars provides a compelling metaphysical methodology that overcomes the limitations of representationalism. More specifically, we claim that his 1948 possible worlds semantics points the way towards a perspicuous account of modality which is superior to contemporary analytic external ontologies in its greater breadth of conception, also possessing affinities with ontic structural realism which present fruitful possibilities for further work.

1. **“Metalinguistic and Expressive”: The Standard Picture of Sellars’ Account of Modality**

In this section we explore the widely-received picture of Sellars as a modal non-descriptivist. Extremely influential here has been Brandom’s (2015) reading of Sellars as essentially moving all philosophical theorizing about modality from a semantic to a pragmatic register. Brandom’s (2015:152) so-called “Kant-Sellars thesis regarding modality” holds that as the contents of ordinary empirical concepts already license counterfactually robust inferences, we need posit no modal facts, because “in using ordinary empirical vocabulary, one already knows how to do everything one needs to know how to do in order to introduce and deploy modal vocabulary”. Brandom (2015:151) notes that it is tempting to conclude that modal expressions function simply as inference-licenses, “expressing our commitment to the goodness of counterfactually robust inferences”. Thus, he concludes, Sellars “ends up saying nothing at all about what one says in making first-hand use of modal vocabulary”, and instead offers a “kind of pragmatic expressivism” (Brandom 2015:190). Of course, if Brandom is correct that the Sellarsian teachings about modality that he discusses pertain solely to pragmatics, this still leaves space for Sellars to say *something else* about modal semantics. More on this below.

Thomasson (2007; 2020a) also draws a modal non-descriptivism from Sellars’s writings, updating and developing it in a view she dubs *modal normativism*, which she claims overcomes the classical problems of modality found in contemporary realist analytic metaphysics. She claims that modal talk merely summarizes certain “constitutive semantic rules” so that we may state them more directly and concisely:

the normativist demystifies modal knowledge by considering the move from using language to knowing basic modal facts to be a matter of moving from mastering the rules for properly applying and refusing expressions (as a competent speaker), to being able to explicitly convey these constitutive rules in the object-language and indicative mood. (Thomasson 2007:150).

Such transposition makes our statement of the rules “more polite and impersonal” by rendering it clearer to whom they are addressed (not one’s immediate interlocutor but all competent language-speakers). It also enables rules to enter into chains of reasoning (e.g. “If Black always moves first, then White never moves first”) which would be impossible with rules stated in the imperative mood (e.g. “Move now!”) (Thomasson 2007:138. See also Thomasson 2020a:60-61). Within this framework, Thomasson claims, modal necessity statements capture what is semantically *obligatory*, and modal possibility statements capture what is semantically *permissible*, and like Brandom she claims there is no need to posit further modal truthmakers.

Thomasson contends that, despite appearances, her view is not a modal anti-realism. Just because there are no modal truthmakers, doesn’t mean there are no modal properties and relations described by true modal statements. Modal properties and relations enjoy a kind of reality as “hypostatizations out of modal truths” (Thomasson 2007:151; 2020a):

All modal truths P may be restated redundantly as “It is a fact that P,” so from “Necessarily, all bachelors are men,” we can get “It is a fact that it is necessary that all bachelors are men.” (Thomasson 2007:149).

But the difference between her account and standard modal realisms is that these hypostatizations should not be understood to *explain* what makes modal claims true. Yet below (§9) we shall argue that even this hypostatization of modal language risks a slide into categorial givenness.

Thomasson thereby explicitly challenges current representationalist trends, by noting that conventions can *ground* modality without *truth-making* it. In a thoughtful exploration of her account’s implications for metaphysical methodology (Thomasson 2007:150-155), she suggests that metaphysical modal facts are unlike scientific facts, but more like the rules of grammar (“the metaphysician's work is analogous to the grammarian’s work of discerning the syntactic rules competent speakers follow but may not be able to articulate” (Thomasson 2007:151)). She thereby offers a vindication of conceptual analysis as providing straightforward solutions to metaphysical existence questions regarding ordinary objects – and thus an “easy ontology” (Thomasson 2020b:159). As Lawson helpfully summarises:

Thomasson maintains that ontological questions have ‘easy answers’. All we have to do to find out whether tables exist is to look out into the world and see if there is anything that meets the application conditions for the term ‘table’. Any competent language speaker, then, will be able to answer existence questions. (Lawson 2020:189-190)

In contrast to Lewis and his actualist colleagues, Thomasson may be understood as presenting an original *internal ontology*,by rejecting conventional metaphysical representationalism (a topic we shall return to in §5). Yet, at the same time, it’s worth noting that all these philosophers pursue an *a priori* metaphysical methodology. Accordingly, we shall argue below (§9) that Thomasson, like Lewis, risks succumbing to the Myth of the Categorial Given. But first we shall explore an alternative view drawn from Sellars’ own writings.

1. **A Sellarsian Possible Worlds Semantics**

Scholars have begun to note passages in which Sellars apparently developed his own possible world semantics. Heyndels (2023) claims that in his early work Sellars provides a regulist (purely rules-based) non-descriptivist account *and* a descriptivist possible worlds account of modality, but leaves the relationship between the two unclear. Sellars’ modal regulism may be observed, Heyndels argues, where his “earlier writings repeatedly emphasise the intimate connection between alethic modal discourse and modal talk” (Heyndels 2024:4). A prime example is“Inference and Meaning”, where Sellars proposes that “modal sentences should be interpreted as object-language sentences which parallel sentences that prescribe or permit certain kinds of assertions (which are the relevant kind of *doings* in this case)” (Heyndels 2024:7). Such an analysis of modality produces a set of “rules of conditional assertion” (e.g. it is permissible to assert ‘**x is a square**’ given that one has asserted ‘**x is a red square**’) (Heyndels 2024:8).

But Heyndels also presents an extended possible worlds analysis of modality that Sellars puts forward in his “Concepts as Involving Laws and Inconceivable Without Them” (CIL). What Heyndels leaves largely unexplored, though, is that Sellars’ account has some unique features by comparison with standard contemporary analytic modal metaphysics. Firstly, Sellars (1948:303) talks not of possible worlds, but *possible histories*, which he analyses as “arrays of exemplifications of universals”.[[7]](#footnote-7) Why does he choose this alternative terminology? Importantly, whereas a set is unordered and each of its elements can appear only once (that is: **{2,2,3}** is identical to **{3,2}**), an array is an ordered collection which permits duplicate elements. Thus, Sellars’ possible histories should be understood as encoding a *structure*, thereby rejecting Lewis’ Humean Supervenience.

As an alternative to the term ‘possible history’, Sellars (1948:311) also suggests the term ‘concrete system’, which he defines as a system “of…possible states of affairs”. Thus, another difference with Lewis, and many of his peers, is that Sellars offers us not a simple concatenation of possibilia, but a system of systems. In other words, he explicates a conceptual framework comprised of modal structures which divide into possible histories or concrete systems that exemplify certain physical properties, with *the possibilities encoded in the relevant structure*. By contrast, Lewis conceives that for every world W which accords with a given law of nature L, there also exist innumerably many worlds which are identical with W except that they break L in particular, random ways:

Another use of my [recombination] principle is to settle…whether laws…are strictly necessary. They are not…Episodes of bread-eating are possible because actual; as are episodes of starvation. Juxtapose duplicates of the two, on the grounds that anything can follow anything; here is a possible world to violate the law that bread nourishes. So likewise against the necessity of...serious candidates for fundamental laws…..It is no surprise that my principle prohibits strictly necessary connections…[as]...I...take a Humean view about laws. (Lewis 1986:91).

In contrast, we must imagine Sellars’ possible histories to be lawful through and through, although the laws themselves differ between families (i.e. structures) of histories. In fact, the presence of different laws is precisely how different families of histories are individuated. Thus Sellars writes, “the criterion of whether or not a structure [of histories and properties/universals] satisfies certain material invariancies is sufficient to discriminate between them” (Sellars 1948:303-304).[[8]](#footnote-8)

Although CIL’s account of modality was published before the apparently regulist IM, Heyndels (2023) notes that the latter does not supercede it, as Sellars reprised his discussion of possible histories in subsequent publications.[[9]](#footnote-9) So how should these two Sellarsian accounts of modality be reconciled? Heyndels concludes that whilst Brandom is correct that Sellars’ regulism pertains to the *pragmatics* of modal talk, Sellars’ possible worlds talk pertains to its *semantics*:

…the regulist analysis provides an account of what is conveyed by the use of modal sentences, which amounts to an account of the pragmatics of modal statement-making. The possible worlds analysis provides an account of the content of what has been asserted in making modal statements. (Heyndels 2024:23)

But this ‘disjunctive solution’ raises further questions. How are this semantics and this pragmatics *related*, given that they concern the same phenomenon, modality? To address this question, our next section explores the distinctive role accorded to categorial investigation in Sellars’ philosophy.

1. **The Specifically Philosophical Usefulness of Categorial Investigations**

We have seen how Sellars does not simply theorize possibilia as external objects, like Lewis and his peers, but describes his semantics of possible histories as a “naïve realist” promissory note to future metaphysical work (Sellars 1948:291-314). Let us now explore further what he might have anticipated here. First we shall argue that Sellars is seeking to challenge certain aspects of modal metaphysics that are generally taken for granted, most notably that all permutations and combinations of properties and particulars are possible, in a kind of logical atomism.

Sellars asks an important definitional question: “In virtue of what is each of these universals a different universal from its fellows?” (Sellars 1948:297). In answering this question, he considers and rejects a Lewisian Humeanism, using an argument which is purely philosophical (a kind of *reductio ad absurdam*):

the family of possible histories which exemplify this domain of universals cannot consist of all “logically possible” arrays of exemplifications of the universals by sets of particulars…If the family were of this nature, then each universal would function “symmetrically” with all the others in relation to the family, and hence would have no distinctive property with respect to its exemplifications in the family. The universals would be indiscernible, and, hence, identical. (Sellars 1948:300-301).

For a simple example to illustrate this argument, consider colours. In our actual world, all the (entirely) red things are not green, and *vice versa*. This contrareity represents a violation of the “symmetry” (as Sellars puts it) which would obtain if every universal/property could be co-exemplified with every other. (As Hume himself put it at one point, “no objects are contrary to one another but existence and nonexistence.” (Hume 1739-40/1978:173)). Now try to imagine the existence of another possible world where things may be (entirely) red and green at the same time. If such worlds are possible, what does it even *mean* to be red, or green? Nothing at all, Sellars here shows us. In other words, we must understand at least some properties as *not applying to certain particulars – not even possibly –* if the concepts which denote them are to have any meaning. And what are these ‘possibility blockers’, other than laws? This is why, speaking in the linguistic plane: “concepts involve laws and are inconceivable without them”. This result reaches beyond the tautologies of logical necessity, to make a claim with real metaphysical heft. Perhaps it might justly be referred to as ‘synthetic *a priori*’.

We believe that here Sellars is performing a delicate balancing act, the existence of which most contemporary analytic modal metaphysicians lack awareness. The problem is how to draw on our intuition to do metaphysical work which ‘tangles with the transcendental’, whilst avoiding falling into the Myth of the Categorial Given. We believe that in CIL, Sellars achieves this by performing a preparatory investigation into modal metaphysics, by first investigating its *categorical structure* on its own, manifest image, terms. But it does not follow, by any means, that his metaphysical investigation has concluded.

Whilst in CIL, the means whereby we should break with the “naïve realist” approach is left implicit, various Sellars scholars have suggested that in his later writings (e.g. Sellars 1981), Sellars developed a methodology for naturalistically articulating categorial claims (Seibt 2000). We find an explication of this methodology in terms of “second-order concepts” by O’Shea helpful. O’Shea claims that Sellars understands categories as:

second-order concepts, or meta-concepts…that functionally classify what are the most basic kinds of first-order concepts we possess, and hence what basic kinds or sorts of items there are in reality as conceived from within the standpoint of a given conceptual framework (O’Shea 2007:115).

On a similar note, Christias (2018:519) claims that Sellars uses second-order categorial concepts to explicate the implicit commitments of first-order descriptive and explanatory terms, “namely the conditions under which alone it is possible to apply them in the world (or use them to make judgments)”. As such, categories should not be understood as directly descriptive of reality (and are, per §1’s definition of representationalism, not directly representational), and our current categories should not be viewed as fixed (which of course would constitute The Myth of the Categorial Given). Rather, they are “rule-governed functional roles, culturally transmitted through language from generation to generation”, and as such are not “transparently present to the human mind” (Christias 2018:519).

But if categorial claims are second-order, internal to a conceptual framework, and metalinguistic, how is categorial *metaphysics* possible? Why is that not an entirely inappropriate reification? We now return to the distinction between semantic and pragmatic metavocabularies which Brandom explicates by stating, “[a] semantic meta vocabulary...enables one to talk about what linguistic expressions refer to or what descriptive concepts let one say. A pragmatic metavocabulary enables one to talk about what one is doing in using linguistic expressions” (Brandom 2015:189-190). This framework allows second-order metaphysical claims about categories to be expressed in *both semantic and pragmatic metavocabularies*. We have already noted that the regulist view may be understood as employing the latter whilst not blocking the former. Our own view, informed by Sellars’ distinctive philosophical naturalism, is that exploring the ‘rule-governed functional role’ of scientific frameworks in a pragmatic register serves as a crucial guide to metaphysical inquiry, prompting us to meaningfully streamline and organise the inferential implications of such frameworks, and thereby determine their semantics. This is precisely Sellars’ strategy in his discussion of the individuation of universals in CIL, presented above, from which he draws a significant metaphysical conclusion concerning the nature of concepts.

To be more specific about Sellars’ method, his basic idea seems to be that we start within an existing (manifest image) categorial framework, which is revised to increase its inferential integration in light of relevant science. Seibt (2000:272) notes that “categorization for Sellars is always recategorization”, and we can build new categorial classifications via “analogical extrapolation of features of the old category”. As such, “[o]ntology…is the project of re-routing some inferential relations within a conceptual structure to enhance the latter’s degree of integration, of searching for the inferentially most economical way of taking inventory of a framework in the material mode” (Seibt 2000:283). In short: categorial metaphysics seeks to increase the coherence and usefulness of the second-order functional categorisation of a first-order scientific descriptive framework, which is understood as picturing/representing the world. This is a process of *internal ontologizing*.[[10]](#footnote-10)

1. **Categorizing ‘math-first theories’**

Our first-order mapping of reality is treated by Seibt and Sellars as having conceptual or linguistic structure. This may be fine in many special sciences, but is a non-trivial assumption when considering heavily mathematized sciences like physics. Accordingly, we now draw on recent work by Wallace (2022) distinguishing between a ‘language-first’ and a ‘math-first’ view of scientific theories.[[11]](#footnote-11) In the language-first view, theories are understood as collections of sentences, be they in ordinary language or, (following certain influential philosophical analyses) in a logical vocabulary like predicate logic. By contrast, the math-first view regards theories as families of mathematical models. In the math-first view, Wallace (2022:1-6) explains, “[t]he theory/world relation…is representation more akin to the relation between map and territory than that between word and object”, and “the content of a physical theory is to be understood primarily in terms of its mathematical structure”.[[12]](#footnote-12)

Wallace (2022) claims that this distinction regarding the nature of theories produces two distinct approaches to scientific realism. For the language-first realist, sentences expressing our first-order concepts are understood as approximately true representations of scientific observables and unobservables. In contrast, the math-first realist takes the relevant models as mapping the observable and unobservable features of reality with at least approximate success.[[13]](#footnote-13)

In physics,“linguistic description of a theory, while common in the scientific literature, tends to be partial, heuristic, and not always consistent” (Knox and Wallace 2023:8-9)). But that doesn’t mean that linguistic descriptions are not useful to us in grasping (in Sellars’ (1963:73) immortal words) “of what is, that it is”. Instead, Wallace (2022:19) dubs the attempt to map linguistic descriptions onto a more precise account of the relevant theory’s ontological claims the *predicate precisification* of a theory:

“A…predicate precisification…is not fundamental: its claims are true, insofar as they are true, in virtue not of its correspondence with the world but of it being a predicate precisification of a representationally successful mathematized theory. This makes the pursuit of ontology into a second-order activity: it tells us not directly what the world is like but how best we can describe it with the tools of natural language. (Wallace 2024a:12).[[14]](#footnote-14)

The consonance with Sellars’ metaphysical methodology here is striking, as a good predicate precisification provides an inferentially or heuristically useful second-order linguistically expressed ontological picture (Wallace 2022; 2024a).

The math-first realist approach enables a fruitful broadening of Sellars’ methodological framework. In math-first realism, our first-order mapping of the structure of reality takes place through relevant mathematical models. This approach provides further reason to regard conceptual ontology (in the form of a predicate precisification) as a second-order activity. Conversely, bringing Sellars into the picture can generate a more precise understanding of Wallace’s account of the role of predicate precisification as second-order ontology, by emphasizing its functional classificatory (and inferentially integrating) nature.

If a broadly Sellasian perspective on the role of philosophy is accepted, where philosophy’s purpose is “to understand how things in the broadest possible sense of the term hang together” (Sellars’ 1963:1), and properly relate the manifest and scientific image, then Sellars’ work validates the worth of second-order, internal, conceptual work over the (we believe, misguided) ambitions of metaphysics as first-order, external ontology. To insist, in opposition to math-first realism, that first-order scientific theories and their ontologies must be understood in language-first terms arguably manifests the Myth of the Categorial Given. In turn, the term ‘predicate precisification’ clarifies that metaphysical categories can be a *semantic* *metavocabulary*. Categories are ‘about the world’ – not because they denote entities in the world, but because they constitute maximally inferentially integrating, second-order predicate precisifications of our first-order scientific picturing of reality.

There is another reason to adopt Sellars’ methodology. McKenzie (2020a) poses a challenge to naturalized metaphysics, understood as a first-order language-first external ontology. Current scientific theories are only approximately true (in language-first realism) or well-modelled (in math-first realism). Yet metaphysical claims are standardly considered true or false *simpliciter*. This apparent mismatch dissipates if, following Sellars, we deny that categorial claims strive for first-order representational truth. It now makes sense that these are fallible and revisable approximations contextualized to the specific first-order framework which they are predicate precisifications of.[[15]](#footnote-15)

1. **Is Sellars a Modal Structural Realist?**

We have shown how, in CIL, Sellars explores a possible worlds semantics consisting of possible histories encoded in a structure. We believe that Sellars’ account shows intriguing resonances with *ontic structural realism* (OSR). OSR is a family of views developed by Ladyman and Ross (2007), French (2014), Esfeld and Lam (2008) and McKenzie (2020b) amongst others, primarily but not exclusively in philosophy of physics, that emphasizes the ontological significance of structure and relations. It has gained adherents both as a defense of scientific realism from antirealist critics, and as a metaphysical framework for interpreting physical theories.

OSR can be understood as a modal realism, insofar as alethic modal relations (and causal relations to the extent that one is realist about causation) themselves constitute a kind of structure (Ladyman and Ross 2007; French 2014). In this section, we argue that, viewed in light of Sellars’ metaphysical methodology, OSR can be reconceived as a modal framework that avoids the pitfalls of standard descriptivist metaphysics, whilst also presenting a new perspective on structuralism as a second-order categorial ontology/predicate precisfication.

OSR theorist French (2014; 2020) draws on related work by Maudlin (2007; 2020) (who is not an ontic structuralist himself) which treats mathematical models of the fundamental dynamical laws of nature as “possible worlds”, and claims that such laws should be regarded as primitive ontological posits:

In theories such as Newtonian mechanics and…General….Relativity…when one has a well-posed initial (or boundary) value problem….a set of boundary values can be shown to have a unique solution given the laws—allowable sets of initial conditions are in one-to-one correspondence with global solutions of the laws. And when the laws are stochastic rather than deterministic a well-defined set of mathematical models are allowed by the equations of motion given a set of initial conditions….All one does is treat the set of mathematical models of the basic dynamical equations as the “possible worlds”...A set of events [or a history] is physically possible…if there is a…model of the fundamental dynamical laws…correspond[ing] to those events taking place. (Maudlin 2020: 525).[[16]](#footnote-16)

French (2014; 2020) argues that we can understand such laws as structural features of reality encoding physical possibilities.[[17]](#footnote-17) Radical forms of OSR render it a totalising ontological theory, either by claiming that relational structure is ontologically prior to objects (priority-based OSR), or by eliminating the category of objects altogether (eliminativist OSR) (McKenzie 2020b). Although doubts have been raised about the coherence of positing relations that are prior to relata (Esfeld and Lam 2008), one need not accept radical structuralism to accept some kind of modal structuralism about the space of possibilities.

We believe that one fruitful way to think about Sellars’s (1948) metaphysical investigations in relation to OSR is that Sellars is attempting to scope out a general framework in which to unify physical laws and other modally imbued structural features of reality in an overall modal metaphysics. This would allow us to clarify and integrate the modal implications of our first-order scientific theories and their models (in the math-first view) and our general concepts (in the language-first view). Unlike French’s (2014) eliminativist OSR, we adopt a big-tent approach and accept that both objects and processes can form concrete systems that instantiate modal structure.[[18]](#footnote-18) (Sellars (1948) at least seems neutral about the ontology for concrete systems.)

Although we have just discussed several apparent categorial claims made by OSR theorists, the OSR literature lacks a clearly defined or unified account of metaphysical categories. There is much discussion about what categories there are (e.g. French 2014; Ladyman and Ross 2007; Esfeld and Lam 2008), and sometimes a list of conditions for a category’s membership (McKenzie 2020b), but little work has been done defining categories themselves. Additionally, as Wallace (2022) notes, such approaches often implicitly treat categorial object/property/relation discourse in first-order terms, in a manner akin to conventional analytic metaphysics. As such, they can appear to be engaging in external ontology, with all its associated issues. Of course, as we noted above, Sellars describes his (1948) view as a naive realist experiment, and perhaps one might regard contemporary structuralism’s implicit first-order metaphysical representationalism similarly. However, we see no evidence of awareness in these authors that their work might simply constitute such a first step. By contrast, if we understand modal structuralism as a Sellarsian categorial metaphysics in the manner described in §5-6 above, the view can be reconceived as a second-order framework for understanding physical modalities, which complements the regulist account by making explicit the modal implications of first-order scientific frameworks via a semantic meta-vocabulary. Here, the aforementioned possible worlds claims drawn out by Maudlin (2020), for example, can be treated as predicate precisifications of the modal implications of relevant theories (i.e Newtonian Mechanics and General Relativity).

Here it is useful to draw again on Wallace. While rejecting metaphysics as first-order inquiry, Wallace advocates math-first OSR. He notes that the math-first realism’s understanding of first-order science “already amounts to a form of structural realism”, and he treats this as expressing the core of our scientific realist commitments (Wallace 2022:1).[[19]](#footnote-19) This nicely fits our proposal to understand the modal implications of first-order mathematical model-based mapping of reality’s structure via a second-order modal structuralist predicate precisification. This is a significant development, as while Wallace discusses object/property/relation talk in second-order terms, he says nothing about how to understand modal metaphysics in this manner.

Sellars’ (1948: 304) view also differs from conventional OSR by accommodating a “broader domain” of modalities which encompasses alternate laws and properties to those of current physical theories. A reasonable constraint on theorizing about such ‘physical impossibilities’ (*albeit* one not explicitly mentioned by Sellars) would be our capacity to provide a reasonably well-defined account of them.[[20]](#footnote-20) We have seen that Sellars’ naturalism leads him to be sceptical of naïve appeals to metaphysical intuitions, ‘givenness’, and the affirmations of the contingent cultural and biological productions of our cognitive faculties (Christias 2023). As such, histories concerning zombies, ‘trout-turkeys’ and other speculative excesses of analytic metaphysics (as vividly charted in (French and McKenzie (2015)) seem unlikely to impress. However Sellars (1948:302-306) does claim that the broadest modal space is a space of *conceivable* histories, and this more expansive approach, compared to the current physical-law-bound OSR (even if treated in second-order terms), is of potentially great benefit to our metaphysical theorizing.

1. **Sellarsian Versus Lewisian Modal Metaphysics**

Having explicated Sellars’ second-order, internal, metaphysical methodology, as we see it, in this section we argue that it is preferable to the first-order external approach epitomized by Lewis’ modal realism. Firstly, as previously discussed, Lewis’ recombination principle presupposes a Humean denial of real nomological connections (Lewis 1986:87–8). There is extensive literature critiquing this assumption that lack of space precludes reviewing here.[[21]](#footnote-21) Instead, we highlight one notable example – Lewis’ recombination principle conflicts with the modal implications of our best current framework for the physics of matter: quantum field theory (QFT). For a property to count as fundamental in QFT it must be mathematically well-behaved at arbitrarily high energies (French and McKenzie 2015; McKenzie 2020b). A quark’s property of colour charge behaves as fundamental only if gluons as well as quarks exist in the theory, and the theory features no more than 16 kinds (or flavours) of quark. Otherwise, “the colour charge will diverge in the [high-energy] limit…” (French and McKenzie 2015:43). Consequently, we cannot assume that all fundamental properties are intrinsic, as this depends on what else exists in any given possible world. This threatens Lewis’ recombination principle, as we cannot assume a world of fundamental physical properties, recombine them at will, and claim *a priori* that what results “is a new manifold of fundamental properties” (French and McKenzie 2015:43). Moreover, there are reasons to suppose that similar issues recur in quantum gravity research, as Lam and Wüthrich (2023) suggest that some quantum gravity theories (e.g. loop quantum gravity and causal set theory) imply necessary connections, potentially blocking free recombination. In contrast, Sellars’ (1948) modal framework explicitly allows for constraints on the coexistence of properties or their bearers, as we have noted.

Secondly, for Wüthrich (2020), most approaches to quantum gravity research imply that spacetime is non-fundamental. The Lewisian possible worlds framework presupposes spacetime’s fundamentality insofar as his worlds are individuated solely through mutual spatiotemporal isolation, and any given world is unified solely by spatiotemporal relations between its parts (Wüthrich 2020). By contrast, Sellars (1948:293) holds that whilst it is sometimes useful to understand possible worlds in terms of spatiotemporal distinctness, this “assumption that every possible world is spatio-temporal…will be revised”. He further elaborates (1948:305), “Granted that a ‘world’ of exemplifications of universals must have a structure, need this structure be of a sort which we would classify as spatio-temporal at all?! These questions confront us with new, and seemingly boundless, horizons to explore”.In short, as long as a Sellarsian history (or concrete system) has *some* sort of structure, it can be distinguished from others on that basis. We are now free to let any kind of successful first-order physical theories and their laws ground the structure of a corresponding second-order modal space. Beyond undermining Lewis’ approach as first-order ontology, these examples show that Sellars’ approach is potentially more broadly applicable than Lewis’ across current and possible future developments in first-order scientific frameworks, and thus has wider heuristic value.

1. **Modality, Easy Ontology and Categorial Giveness.**

There are commonalities between Thomasson’s modal normativism and our interpretation of Sellars, as both reject modal representationalism and turn to pragmatic metavocabularies to derive significant insight into modal metaphysics. However, a notable difference appears when comparing Sellars’ and Thomasson’s approaches to categorial ontology. As §3 outlined, for Thomasson (2014), if the application conditions for ordinary language terms for objects are met, there is a resulting analytic entailment that such objects exist. Thomasson (2020b:164) similarly claims that “easy inferences enable us to acquire knowledge of such things as modal facts and properties”. However, this risks a slide into the Myth of the Categorial Given. Thomasson forecloses the possibility of science-motivated philosophical revisions to our manifest image categorial framework, due to a deflationary, Carnap-influenced, meta-ontology, where beyond ‘easy inferences’, further metaphysical debates regarding entities’ real categorial status are deemed futile.

By contrast, Sellars emphasizes the defeasibility of our contingently evolved manifest image categories, and their accompanying linguistic system, in light of science’s superior descriptive and explanatory powers. Christias (2018:532-533) explains how this understanding of the metaphysical enterprise is particularly difficult to achieve, given a peculiar way in which manifest image generalizations are “implicitly theoretical”. Like scientific generalizations, they offer expansive explanations for lived reality, yet they lack the counterfactual robustness of genuine scientific work:

Empirical generalizations formulated in manifest-image…terms…[are]...unstable (non-lawlike)...subject to observationally unpredicted variation…[and]....by failing to be lawlike (counterfactually robust) under certain conditions, are defective in their own terms (Christias 2018:534-334).

For Sellars, the scientific image first emerges ‘immanently’ from the manifest image in order to account for its explanatory failures and apparent anomalies (Sellars 1963:14). Consequently, for Sellars, we should *not* take ordinary language as the guide to metaphysics. Rather, our metaphysics is our best (most elegant and inferentially useful) predicate precisification of the relevant first-order scientific inquiries. Moreover, as previously mentioned, in physics “linguistic description of a theory…tends to be partial, heuristic, and not always consistent” (Knox and Wallace 2023:8-9). Thus, the easy ontology approach is not only too conservative, but as a ‘single-level’ approach it also inevitably fails to honor the full complexity of the conceptual contours of contemporary physics.

1. **Conclusion**

For Sellars, a full, non-naive, treatment of modality means abandoning ‘armchair modal metaphysics’ and taking a naturalistic approach which enables us to revise our philosophical categories to best accord with the insights of current science. But such an approach risks confusing the projects of physics and metaphysics. Sellars’ solution is to highlight and respect the *second-order*,distinctively philosophical, nature of categorial metaphysics, as a process of making explicit, critically scrutinizing, summarizing and streamlining what a particular first-order scientific framework implies about reality, rather than seeking to directly denote entities in that reality. This understanding arguably allows us to make sense of CIL’s modal structuralism in the non-naive manner that Sellars gestured towards but did not explicate. The result displays interesting affinities and differences from the scientific metaphysics known as OSR. It also has demonstrable advantages over the ‘external’ modal metaphysics of Lewis in its deft avoidance of certain conceptual limitations in his categorial schemes engendered by his embrace of the Categorial Given. It also synchronizes nicely with – and promises to further enhance – a recent significant development in philosophy of science: Wallace’s math-first realism. Sellars thereby shows us how philosophers can contribute to our understanding of modality not as ‘pseudo-physicists’, or as grammarians, but *as philosophers* – in a way that avoids categorial giveness, and the representationalist excesses of much analytic metaphysics.

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1. What exactly ‘making’ might mean in this context is an interesting question, explored in (Legg 2021). [↑](#footnote-ref-1)
2. Lewis (1986:3-4, and 134-135) does hedge his methodological bets somewhat, in a manner potentially escaping this charge. Nevertheless, many tacit ordinary language-based presuppositions, including that the world is composed of particular objects (as opposed to processes, structures or something else), are seemingly taken for granted by him. [↑](#footnote-ref-2)
3. This is a reasonably common methodological position in metaphysics, as Thomasson (2014:51-53) notes. [↑](#footnote-ref-3)
4. The Mill-Ramsey-Lewis ‘best system’ view then understands laws of nature as descriptions of the Humean mosaic’s regularities featuring in our best deductive system, displaying the optimal combination of simplicity and strength (Lewis 1994, Berenstain and Ladyman 2010). [↑](#footnote-ref-4)
5. Lewis (1986:141), somewhat mockingly, calls these abstract objects ‘*ersatz worlds*’, sorting them into three varieties: “linguistic, on which ersatz worlds are…constructions out of words of some language…pictorial, on which they are like pictures…and represent by isomorphism; and magical, on which they just represent”. [↑](#footnote-ref-5)
6. Ladyman and Ross (2007:10-27) provide an extensive list of these. See also French and McKenzie (2015). [↑](#footnote-ref-6)
7. We should note that Sellars (1948) does not commit to any specific theory of universals, and uses the term as essentially a synonym for physical property. [↑](#footnote-ref-7)
8. See also, “the material invariancies…we found to be necessary to the differentiation, and hence to the existence, of a domain of universals...are exactly laws of nature” (Sellars 1948:309). [↑](#footnote-ref-8)
9. Henydels (2023) cites Sellars (1974:viii-ix) and Sellars (1963:295-296), amongst other passages. [↑](#footnote-ref-9)
10. Seibt (2000) does accord second-order functional metaphysical representation a novel kind of representational adequacy, which is distinct from first-order representationalism. However, we believe it makes more sense to say that second-order categories provide a *predicate precisfication*, than that they represent. [↑](#footnote-ref-10)
11. The former is akin to the ‘syntactic’ and the latter the ‘semantic’ view of theories (Winther 2021). Wallace’s terminology is chosen for its greater clarity. [↑](#footnote-ref-11)
12. This work connects with recent more general investigations into ‘iconic’ vs. ‘symbolic’ representations (e.g. Legg 2008). From a Sellarsian perspective, the notion of ‘picturing’ could be invoked (DeVries 2005; Seibt 2009; Sachs 2019; Legg 2024), which would be an interesting topic for a future study. [↑](#footnote-ref-12)
13. See Wallace (2022, 2024b) for a detailed case for math-first realism. Its stated benefits include better fitting scientific practice, providing a clearer understanding of intertheoretic relations and theory equivalence, and dissolving underdetermination problems. [↑](#footnote-ref-13)
14. If Wallace's methodology is adopted, the various forms of OSR may be understood as candidate predicate precisfications for current quantum and relativistic theories. [↑](#footnote-ref-14)
15. Notably, Sellars accepts that “assessments of functional role similarity enable rational comparisons of conceptual development and change over time” (O’Shea 2022:6). Sellars (1981) also views the broad applicability of a categorial concept to multiple sciences, and to both current and future scientific contexts (as he claims processes are (Seibt 2000)), as a significant virtue which illustrates the concept’s usefulness. This adds a projective dimension to his metaphysical approach. [↑](#footnote-ref-15)
16. Associating models with possible worlds (and histories) does not demand Maudlin's specific time and temporal production-related positions, as French (2014) makes no such commitments when discussing this (See also Chen and Goldstein’s (2022) discussion of primitive laws constraining physical possibilities without the need for temporal production). Sellars’ alternate terminology of possible concrete systems may also be more perspicuous in some contexts, such as quantum gravity theories that are not fundamentally spatio-temporal (Wüthrich 2020), although there is no reason to suppose that Sellars’ ‘histories’ must be spatiotemporally instantiated (see §8). [↑](#footnote-ref-16)
17. French (2014) also understands symmetry group structure (where, in general terms, a symmetry is an invariance under a group of transformations) in quantum mechanics and quantum field theory as a modal structure encoding physically relevant possibilities, such as for particle kinds. [↑](#footnote-ref-17)
18. Sellarsian process ontologists can understand a possible history as the history of a process, whose possibilities are encoded in the relevant modal structure. [↑](#footnote-ref-18)
19. Wallace (2022:23) also notes that “the claim that fundamentally speaking there are no objects...in the ontic structural realism literature….is more or less realized in math-first OSR, although it would be more accurate to say that the object/property/relation way of describing reality is not applicable at the most fundamental [first-order descriptive] level.” [↑](#footnote-ref-19)
20. Such cases include ‘possible worlds’ where gravity obeys an inverse cubed law. See Maudlin (2020) for this and further examples. [↑](#footnote-ref-20)
21. Berenstain and Ladyman (2010) review objections to Humeanism**.** One salient objection concerns circularity: “a fact in the Humean mosaic helps..explain why some regularity is a law (first premise), but that law…helps…explain why that mosaic fact holds (second premise)” (Lange 2023:1000). Karakostas (2009) also suggests quantum entanglement as a potential problem for Lewis' recombination principle, although we don't have space to discuss this here. [↑](#footnote-ref-21)