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The Greatest Mystery of Futures Studies

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ABSTRACT

Futures studies has long lived with a puzzle: every domain the field investigates is already studied by some special science. Three familiar replies—that futures studies extracts insights, takes a longer view, or includes lay perspectives—each capture something real but do not, on closer inspection, individuate the field at the level of its object. A proper object, we argue, is the *possibility space*, a structured field that is, in essence, constitutively modal, multi-domain, anchored in contested presents, and reflexively shaped by accounts of itself. Futures studies and the special sciences are, probably, doing complementary cognitive labor rather than competing.

1 | The Mystery

Futures research, despite being a dedicated field with its own goals, methods, and assumptions, carries a mystery the field itself has never quite settled. The discipline studies possible futures across domains of life, every one of which is already studied by some other field. The existence of futures research as an independent field therefore poses a question that returns whenever one tries to articulate what the field is actually for:

1.1 | Why Do We Need Futures Research as an Independent Field?

Each domain of life, from the natural to the human sciences, is extensively explored by dedicated fields of research, and these disciplines investigate both the past and the present states of their subject matter. If all aspects of life are already examined by different research fields, what unique role does futures research play that explains its existence as an independent discipline?

And the mystery runs deeper than a simple division of labor. Suppose the worry is granted in full—suppose the home sciences, or the neighboring fields that have grown up around

possibility, already do the very thing futures studies takes itself to do. The question does not thereby dissolve; it sharpens. For one must then ask why this is not enough: why, if the work is already being done elsewhere, a separate field keeps having to be called into existence to do it again, under one name after another. It is this deeper form of the question—and not the simple observation that every domain has its home science—that the paper means to take seriously.¹

The puzzle is not a rhetorical setup, and it does not, in essence, depend on whether anyone has stated the complaint in print or not. It is, rather, a conceptual question that stands on its own and that the very structure of the subject matter of the field raises by itself: if every domain of life is already covered by some home science, what distinct object is then left for a separate field, the futures studies, to study? No citation is needed in order for the force of this question to be felt. It is enough to notice that the subject matter of the field is, on the face of it, already divided among the existing sciences. That the worry appears in passing remarks, in referee reports, and in the periodic identity crises of the field is, of course, a corroboration; but the question would be a live one even if it had never been voiced, for the very reason that it follows from the simple observation that every future has its home discipline. The mystery, moreover, is not a mystery about a name. It concerns

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the object, and not the label of whatever field happens to study it: no matter how we happen to name the fields—the futures studies, the possibility studies, the opportunity-space geography, the state-space mathematics, or the risk analysis—the same question returns, of why the traditional sciences should be the ones left to deliver, from within, an object that they do not, in fact, deliver. The proliferation of the names is, in essence, the recurrence of the one puzzle, and we return to it in §4.

The complaint runs roughly as follows: economics studies economic futures, climate science studies climate futures, sociology studies social futures, educational research studies the futures of universities; and so on. Whatever interesting questions there are about possible futures of any given phenomenon, the relevant special science is already in a position to address them, and is—by virtue of its domain expertise—in a better position than any general field operating from the outside. Surely, if domain experts are already doing this work, the redundancy is real: the field has, on this reading, no proper object of its own.

A question of this kind invites, almost immediately, two quick dissolutions, and it is worth the trouble to state each of them in its strongest form before we show why neither of them dissolves the mystery.

The first dissolution says that there is, in fact, no separate object here at all, for one can simply go to the traditional sciences and ask from each of them what it has to say about its own future. Demography tells us about the demographic futures, climate science about the climate futures, and so on; one sums up the answers, and nothing is left over. The reply has a real force, and we should concede the part of it that is true: the futures-studies researchers do, indeed, sometimes contribute to the domain journals and to the forward-looking work that is done inside the domains, and some of the most cited results of the field are located precisely there. But the dissolution mistakes a sum of the answers for the thing that does the summing. The domain outputs do not assemble themselves. No home science (i) types those outputs modally—that is, sorts the predictable from the plausible, the alternative, and the merely conceivable across the domains at once—nor (ii) projects them from a contested reconstruction of the present, nor (iii) tracks the way in which the accounts of the assembled future double back and reshape it. The assembling across the domains, under these three operations, is precisely the *object* that the dissolution overlooks. And the concession does not, in the end, rescue the dissolution: when a futures researcher contributes to a domain journal, what is contributed is itself an assembly that is structured by the futures tools—a modally typed, multi-domain and reflexively aware construction that is then carried into the domain. This is the object reappearing under a domain masthead, and not the home science doing the work on its own.

The second dissolution says that the futures studies is *for* the policy—its point being to inform the decision-makers—and that the demand for a distinct *object* is therefore misplaced. This is, again, partly right, and the field has, for a long time, taken the decision-support to be one of its central purposes. But a purpose is not an object. The decision-support is an *objective* that one may pursue, and a committee of domain experts could

discharge it perfectly well, each of them doing the forward-looking work of their own field and then deliberating together, without any separate discipline existing at all. If the informing of decisions were all that there is to it, the redundancy worry would simply return one level up: the special sciences, when they are jointly convened, could do the informing. The policy-use, in this sense, tells us what the futures work is *for*, but it does not tell us what the futures studies *is*; it leaves the question of the object exactly where it was found.

A mystery that survives both of these dissolutions—that is neither dissolved by the dividing of the future among the home sciences, nor by the reducing of the field to its function of decision-support—is not a straw man. It is, rather, the question that the rest of this paper takes seriously.

The puzzle is also, however, a diagnosis the field has been making about itself. Son (2015), in a three-phase periodization of Western futures studies, ends with a phase the author characterizes as one of fragmentation and ongoing identity crisis, in which the field's practical influence in corporate, national, and civil contexts has come at the cost of a clear answer to what, exactly, futures studies is *for*. Marien's reality-based diagnosis goes further, debunking what he calls seven disabling myths about the field—including the myth that futures studies is already a real discipline rather than a loose constellation of communities, practitioners, and methods—and arguing for a humbler, more rigorous, more institutionally serious form of futures inquiry. Slaughter's knowledge-base project responds to roughly the same anxiety from a constructive direction by trying to identify the language, concepts, methods, networks, and innovations that would constitute a recognizable core for the field. The puzzle that opens this paper is, in essence, the philosophical version of these diagnoses. Their concern is that futures studies has lost, or has not yet developed, a clear sense of itself; the philosophical version of the same concern is that the field has never had a fully worked-out answer to the question of what its proper object is.

This is the bar that any defense of futures studies as a separate discipline has to clear. The defense cannot be merely that futures researchers happen to work on these questions; that would only show that there is a community of practitioners, not that there is a distinctive intellectual object for the field to study. Bell's substantial *Foundations of Futures Studies* takes on the task at the level of identifying assumptions, purposes, and methods that hold the field together—possible, probable, and preferable futures, alongside an integrative epistemology that runs from positivism to critical realism—but the deepest version of the question concerns the field's *object*. What does futures studies study that the special sciences do not?

Three familiar replies have circulated in the literature, and each captures something real about how futures research is sometimes done. We will see, in §2, that none of them individuates the field at the level of its object. The diagnosis matters: it is not enough to dismiss these replies in passing, for the very reason that each of them has, at one point or another, been treated as the answer to the redundancy worry. If they fail, they fail for reasons it is worth being precise about. The remainder of the paper turns to a fourth proposal that we will defend in §§3–6,

but the center of the discussion is the careful examination of why the existing replies may not be enough. Let us now turn to the details of the three replies.

2 | Three Replies, and Why They May Fail

Three replies to the redundancy worry recur in the literature, and they correspond, roughly, to three different things futures research is sometimes thought to be doing. The first locates the field's distinctive activity in the *extracting* of forward-looking insights from contributing disciplines. The second locates it in the *taking of a longer time horizon* than the special sciences typically take. The third locates it in the *including* of lay perceptions and expectations alongside expert knowledge. Each of these is a real activity that real futures researchers really do. The question is whether any of them gives the field a distinctive intellectual *object*—that is, whether any of them tells us what futures studies *is*, rather than just what futures researchers happen to *do*. We are inclined, in the end, to think that none of them does, and that is the diagnosis we now develop. Our reasons for thinking each reply may fail are different in each case, and the differences are themselves informative.

2.1 | The Extraction Reply

The first reply is exemplified by techniques such as the Delphi method (Linstone and Turoff 1975), which structures repeated rounds of anonymous expert judgment with controlled feedback in order to draw out insights from contributing experts' respective fields. The process of extracting could be perceived as a "squeezing out" of insights from contributing experts' respective fields, thus producing a unique vantage point. On this view, futures research is the discipline whose proper activity is the eliciting and aggregating of forward-looking judgments that other disciplines are able to produce but, for various reasons, do not produce on their own.

There is something to this. Domain scientists do, sometimes, have forward-looking views about their subjects that do not appear in their published research, and a structured elicitation process can, probably, surface those views in a useful way. The Delphi method has been used productively for half a century to do exactly this kind of work. The reply, however, faces two difficulties that, taken together, suggest that it cannot bear the weight the redundancy worry places on it.

First, if the extracting of forward-looking judgments from domain experts were a genuinely valuable activity in its own right, it is hard to see why the special sciences do not already do it. Surely, the demographers, the climate scientists, and the energy-system modelers have an interest in the forward-looking views of their colleagues, and they are not institutionally barred from organizing structured elicitations of those views. They do, in fact, do this—the IPCC reports, the EU's reference scenarios, the various technology-roadmap exercises in industry, are all variants of structured expert elicitation conducted within the special sciences themselves. If extracting is what futures studies does, the activity is one other fields do too, and there is no obvious reason why a separate discipline is required to

specialize in it. The reply, in other words, individuates the field at the level of a *technique* rather than at the level of an *object*; and techniques are, in principle, portable.

Secondly, and more deeply, the extraction reply makes futures research look like a derivative or merely procedural activity—a reporting device for what the special sciences already know, packaged with a particular elicitation protocol. If that were all there is to it, futures studies would not be an independent discipline but, rather, a service activity attached to the ones that produce the substantive content. The reply also presupposes that the relevant content is already, in some sense, in the heads of domain experts, waiting to be extracted by the right method. We will see in §3 that this is, in essence, the wrong picture. For the moment, however, the more limited diagnostic point is sufficient: even if the extraction reply captures something real, it does not give futures studies the kind of *standing object* a discipline needs to defend its independence.

2.2 | The Long-View Reply

The second reply locates the field's distinctive activity in its time horizon. Special sciences attend to the near and the present; futures studies, on this view, attends to what could happen on a horizon of decades or centuries. Futures research, in this picture, is the long-horizon wing of forward-looking inquiry generally—the discipline whose proper subject matter is what lies beyond the planning horizons of the special sciences.

Brier (2005) reports that futures researchers themselves frequently invoke this reply, but his survey of 47 practitioners shows that there is no single "futures" horizon. Time horizons depend on the subject and on the audience, ranging from a few years in applied corporate work to several millennia in some academic exercises. Son (2015), in turn, shows that the time horizons typical of futures research were products of Cold War strategic planning and post-industrial visioning during specific phases of the field's development, and not features constitutive of its object. The longer-time-frame defense therefore fails on the historical-empirical evidence: there is no single time horizon that futures research operates on, and the time horizons the field has used at different points in its history were artefacts of the institutional and political contexts in which the field was working.

There is, however, a deeper conceptual difficulty with the long-view reply, and this is the difficulty that, on our reading, ultimately disqualifies it. The issues at the very heart of futures research—(i) epistemic difficulties in the knowing of the future, (ii) the entanglement of the future with accounts of it, and (iii) the (in)ability to relate to certain futures—are not associated with temporal scales in any straightforward manner. They are associated, rather, with different notions of *possibility*, and these notions cannot be mapped cleanly onto temporal scales. Some short-term futures are deeply uncertain; some long-term futures are highly constrained. A pension forecast for next year may rest on assumptions that are more contestable than a forecast about the long-term cosmological trajectory of the solar system. The mapping of "near" to "predictable" and "far" to "merely conceivable" is, in essence, the kind of folk picture that does not

survive any serious examination of the modal structure of forward-looking inquiry. Ramírez and Selin's (2014) discussion supports rejecting a simple either/or between plausibility and probability and shows that the different scenario schools use these terms for different purposes and at different stages, which is only another way of saying that the modal notions do not sit in fixed boxes.

If futures studies were simply "what other sciences do, but further ahead," the field would not be a separate discipline; it would, rather, be the long-horizon wing of every special science. The long-view reply, like the extraction reply, individuates the field at a level that does not give it a distinctive object.

2.3 | The Inclusion Reply

The third reply suggests that what is distinctive about futures research is that the field integrates not just the knowledge generated by other research fields but also the perceptions and expectations of people in their diversity. On this view, futures research derives its novelty from its inclusivity: the field brings lay perspectives into the construction of forward-looking accounts in a way the special sciences typically do not.

This reply has more going for it than the previous two, for the very reason that it picks out something that is, probably, distinctive of how futures research is practised in many of its more participatory variants—visioning exercises, citizen panels, and the various participatory-foresight methods. The question, however, is whether this distinctiveness is at the level of the *object* or at the level of the *method*.

We do not think it is at the level of the object, for the following reasons. First, it is not clear that laypeople possess insights about the future that elude seasoned researchers in any systematic way. They may have local knowledge that researchers lack; they may have value-commitments that should figure in the assessment of desirability; they may have practical experience with the systems that the futures concern; and so on. But the same can be said in any policy-relevant domain, and the response in those domains has been to develop institutional mechanisms for the incorporation of lay input—public hearings, deliberative polls, citizens' assemblies—within the special sciences themselves rather than within a separate discipline. If lay inclusion were the distinctive object of futures studies, the question is, again, why the relevant special sciences do not already do it; and to a significant extent, they do.

Secondly, the converting of people's beliefs into credible future scenarios involves significant interpretation and assumptions, adding another layer of complexity. Perhaps these assumptions are the true focus of futures research? If we consider the existing body of work in the field, this proposition does not seem to be entirely accurate. Futures research creates content and does not focus merely on the theoretical assumptions needed to derive scenarios from beliefs. The interpretive work is real, and a great deal of methodological development in the field—in particular the layered approaches such as Causal Layered Analysis (Inayatullah 1998)—is concerned precisely with the careful handling of how beliefs, narratives, and worldviews

shape the futures that get articulated. But this is not the same as saying that the field's *object* is lay perception. It is, rather, that lay perception is one of the *inputs* to whatever the field's object turns out to be.

Thirdly, the inclusion reply, like the extraction reply, individuates the field at the level of a methodological commitment rather than at the level of an object. A discipline can, in principle, include lay perception within its standard methods without becoming a separate discipline; and this is what most of the policy-relevant special sciences are gradually learning to do. If inclusion were the distinctive feature of futures studies, the special sciences could simply become more inclusive, and the redundancy worry would return in much the same shape.

2.4 | The Shape of the Diagnosis

The three replies fail in similar ways. Each captures something true of some futures research; none individuates the field at the level of its object. The extraction reply mistakes a *technique* for a discipline; the long-view reply mistakes a *horizon* for a subject matter; the inclusion reply mistakes a *methodological commitment* for an explanandum. In each case, the failure has, in essence, the same shape: the reply identifies something the field *does* without identifying something the field *studies*.

The diagnosis matters because it tells us what a successful reply would have to look like. A successful reply has to identify an intellectual object the special sciences are not designed to study, and that is not reducible to a technique, a horizon, or a methodological commitment. The remainder of the paper offers one such candidate. We do not claim it is the only one available. We do think, however, that any defense of futures studies as a separate discipline that does not engage with the object-level question is, in essence, conceding the redundancy worry without being able to answer it. The case has to be built on what futures studies is *for* in a sense the existing replies do not quite reach. Let us now turn to the proposal.

2.5 | Object and Objective

The diagnosis can be sharpened by a distinction that comes from a quite different corner of the literature. In their account of theorizing in management accounting, Lukka and Vinnari (2014), who develop a distinction that Lukka (2005) had introduced in passing, separate two roles that a theory can play.² A *domain theory* is a particular body of knowledge concerning a substantive topic area as it is situated within some field; a *method theory*, in turn, is a meta-level conceptual system by means of which the substantive issues of the domain theory at hand are studied. These roles are relative, and not absolute: one and the same theory can be a domain theory in one field and a method theory in another one—Foucault, in their own example, is a domain theory in sociology but a method theory in accounting. A recurring pathology that they identify is the *unclear theoretical ambition*: the studies that do not say at which of the levels their contribution is meant to land, and that cannot, for this reason, be evaluated as either the one or the other.

The futures studies have suffered from exactly this kind of unclarity, and this accounts for much of the difficulty that the field has had in answering the redundancy worry. The heterogeneous methods of the field—the Delphi, the scenario planning, the Causal Layered Analysis, the backcasting, the horizon scanning—together with the aims of method-improvement and decision-support, are *objectives*: they are things that are pursued within or upon an object, and they are proper goods of the field. The *possibility space*, by contrast, is the *object*—the domain—within and upon which those objectives are pursued. The two are not, in any way, in competition. The improving of methods, or the studying of how the tools are selected and implemented, is a work at the level of method; and a great deal of the valuable scholarship in the field is described correctly in this way. To claim the possibility space as the object of the field is, however, a work at the level of domain, and it is an answer to a different question. A field can be, at one and the same time, an applied-methods enterprise and a field that has a distinctive object; the methods are, indeed, heterogeneous precisely for the reason that the object is a multi-aspect one (a point to which we return in §6). To say this is not to deny that futures studies is, in part, a toolbox; it is, rather, to locate the place where, beneath the toolbox, the theoretical ambition of the field actually lies. What the field has been lacking is not the methods but a clearly named domain—and the naming of the possibility space as that domain is what fixes, finally, the level at which the contribution is meant to be read.

3 | The Possibility Space

Our proposal is that a proper object of futures studies is what we will call *the possibility space*. A possibility space is a structured field with four interlocking features: (i) a modal architecture, (ii) a multi-domain composition, (iii) a contested initial state, and (iv) a reflexive structure. The case we make in §4—that no special science studies a possibility space as such—depends on the four features being inseparable. If they were independent, a special science might pick up one or two of them and do most of the work futures studies claims as its own. If, by contrast, the four are aspects of one object, then a science that handles only some of them is not studying a possibility space at all but, rather, something else.

3.1 | Modal Architecture

Possibility spaces have, to begin with, a modal structure. The estimating of possible futures requires having different notions of possibility at hand, and these notions have to be teased out before any serious work on a possibility space can proceed. The relevant notions can be identified, for our purposes, as follows.

3.1.1 | Predictable

By predictable, we mean an event that follows straightforwardly from the current situation and a set of generalizations that govern the domain at hand and are not expected to change before the event. Predictability requires, moreover, that we have epistemic access to the relevant determinants. Predictable should not be equated with *inevitable* or *necessary*; these are stronger notions.

3.1.2 | Plausible

By plausible, we mean an event that follows from a credible set of generalizations and a credible description of the current situation. What we consider as credible may not match reality, but we have good reasons to believe it.

3.1.3 | Possible

By possible, we mean an event that either (i) is not in contradiction with what we know, or (ii) follows from an internally coherent and somewhat credible set of generalizations and a description of the current situation. Plausible and predictable events satisfy these criteria. Possible, however, demands less than plausible or predictable.

3.1.4 | Alternative

By alternative, we mean an event that goes against what we believe and value. Whereas possible forces us to consider many different futures, alternative makes this consideration a value in itself. An alternative future is a future that follows when we question our knowledge and values and ask “what if we are wrong?”

3.1.5 | Desirable

By desirable, we mean a future we find valuable and ethically sound. A desirable future needs to be a possible future; otherwise it becomes, in essence, an obsolete utopian scenario.

3.1.6 | Conceivable

By conceivable, we mean an event that is (i) conceptually and ontologically coherent, and (ii) can be reasoned about. Conceivable events do not need to be possible, credible, or in agreement with what we know. Conceivable futures, therefore, include all the futures that *can* be thought of.

These notions are familiar from work in modal epistemology and modal metaphysics, where corresponding distinctions are drawn between the kinds of access one might have to non-actual states of affairs. Yablo (1993) defends a cautious but ineliminable evidential role for genuine *conceivability*—a state in which a proposition appears possible in thought rather than merely “for-all-one-knows”—a stance that maps neatly onto the line we draw between conceivable and possible. The wider literature on modal knowledge connects modal claims to counterfactual reasoning, to the analysis of essences, and to the apparatus of agency, but for our purposes the central point is, in essence, that the layered structure of modality is a real feature of forward-looking inquiry rather than a labeling exercise.³

What is distinctive about possibility spaces is not that they involve modality—the special sciences traffic in modal claims constantly, in laws, in counterfactuals, and in projections. Woodward (2003), in particular, has shown how richly causal explanation in the special sciences itself depends on a modal apparatus: to say that X causes Y, on Woodward’s interventionist account, is to say that there is some idealized intervention on X that would change Y, and explanatory generalizations are good to the extent that they remain invariant under a

relevant range of such interventions. What is distinctive about possibility spaces is, rather, that they involve all of these modalities together and in interaction. A possibility space contains (i) predictable continuations of present trends, (ii) plausible developments off those trends, (iii) possible scenarios that lie outside what is currently credible, (iv) alternatives that arise when current commitments are questioned, (v) desirable trajectories that some agents are working toward, and (vi) conceivable scenarios at the limit of what *can* even be reasoned about. Woodward's invariance-under-interventions captures much of the predictable layer; it does not, by itself, tell us how to position the predictable alongside the plausible, the alternative, the desirable, and the conceivable.

This last point is essential. In ordinary practice, it is tempting to picture the modal layers as a cone: a single apex that is located in the present, and that opens smoothly outward, the predictable lying nearest to the apex and the merely conceivable at the rim. The futures cone of Voros (2003), which draws on the earlier work of Hancock and Bezold (1994), invites exactly this kind of a reading, and we wish to mark it out, here, as the wrong picture—as the foil against which two of our four features are doing their work. The cone misleads in three connected ways. First, it presents the modalities as if they coexisted in fixed ratios at any chosen moment of the future, as though one could stop at some date and read off how much of it is predictable, how much plausible, and how much alternative—whereas in fact the modal types do not all of them persist together as one moves outward, and which of them is available depends on how far one is willing to go and on what one is satisfied with. Secondly, it abstracts away from the contested initial conditions, for it draws a single and settled apex, while the present from which any space is opened is itself a disputed matter and has to be reconstructed before it can be projected from at all. And thirdly, it assumes a smooth and monotonic expansion—always more possibilities the further out that one looks—whereas a possibility space can, just as well, *shrink*, as the commitments harden, the options foreclose, and the reflexive accounts of the future narrow the very field that they describe (Heinonen and Virmajoki 2026). The first of these errors is dismantled by the modal-architecture feature, and the second and the third by the contested-initial-conditions feature. We mention the cone, then, not as a model to be adopted, but as the intuitive picture that our account is designed to replace. The timescale we can use in the estimating of the future depends on the type of possibility we are satisfied with. If we wish to have plausible futures, we cannot go too far away; if we are satisfied with conceivable futures, we can move much further than centuries forward. What we cannot do is take some moment in the future and ask which futures at that moment are predictable, plausible, alternative, and so on, for the very reason that these types of possibilities might not all exist at that moment.

The modal architecture of a possibility space is therefore not the simple temporal layering the future cone might suggest. It is, rather, a more complex structure in which the modalities interact, constrain each other, and disappear at different rates as one moves outward from the present. The study of this architecture is, in essence, a recognizably philosophical activity, and no special science treats this layered architecture as its proper subject matter.

3.2 | Multi-Domain Composition

A possibility space is constituted by inputs from many domains, and the relation between those inputs is itself part of the object of study. This is rather more than the practical observation that interdisciplinary work is hard. It is, rather, a constitutive claim about what a possibility space is.

There is, first, the question of who is supposed to map the futures of any given phenomenon. An individual scientist? Some scientific institution? Science as an abstract agency? Whose ideas are used to tell the futures affects what is said—scientists in any domain have disagreements, and the “domain input” to a possibility space is therefore not a single deliverable produced by a unified domain but, rather, a contested distribution of views, models, and explanatory preferences. Futures studies inherits this contestation rather than starting from a settled domain output.

Beyond this, there is no clear “stock” of regularities that can be used in the estimating of where the future takes us. The understanding of complex phenomena in the human world requires that we use several regularities together. This is difficult in itself but becomes even more challenging once we realize that the regularities can be made to work together only after deep assessment of (i) their mutual compatibility and (ii) their ranges of invariance—exactly the kind of variable-by-variable assessment Woodward (2003) shows is indispensable for stable causal explanation, but which becomes acute when the variables come from different sciences with different standards for what counts as a good intervention. Such a task is beyond any individual scientist or scientific field. Surely, no single discipline could determine the consequences of a major demographic transition for political stability, labor markets, inter-generational welfare, and cultural transmission. Phenomena of this kind are precisely the cases whose study requires the assembling of regularities from demography, economics, political science, sociology, and public health—and the assembly is constitutive of the inquiry, not antecedent to it.

This is exactly the territory mapped by recent work in philosophy of science: integrative pluralism (Mitchell 2003, 2009), the dappled-world ontology of Cartwright (1999), trading zones (Galison 1997), and interdisciplinary success without integration (Grüne-Yanoff 2016). What the pluralism literature establishes—(i) that the world resists tidy unification, (ii) that different domains employ generalizations of different scopes and ranges of invariance, and (iii) that the combining of domain outputs requires further work that none of the domains is itself doing—is exactly what futures studies has to take as its starting point. A possibility space is not a domain output. It is, rather, what has to be assembled when domain outputs alone are not sufficient.

3.3 | Contested Initial Conditions

The third feature is that the present from which a possibility space is projected is itself disputed. This complicates the standard picture according to which knowledge of the future proceeds by extrapolating from a known present and a set of stable regularities.

It is often far from clear what our initial conditions in many phenomena currently are. There are, in fact, significant disagreements about the state of the current world. The current geopolitical landscape, for example, is a subject of ongoing debate: some analysts argue that we are witnessing a shift in global power dynamics with emerging economies gaining influence; others believe established powers retain significant sway; and ongoing conflicts and trade reorderings obscure all this. A major step toward the understanding of futures is, in essence, to recognize that the initial conditions are themselves contested, and to try to reconstruct what they are. This information is far from given, unlike what is often suggested.

It is important to be precise about what this claim asserts and what it does not. The claim is that the initial conditions are *contested*—that what the present is, is itself a disputed matter and has to be reconstructed before anything at all can be done with it. The claim is emphatically *not* that the fixing of the present would license the forecasting. A substantial literature on the complexity and on the sensitivity to the initial conditions has established that, in complex adaptive systems, even precisely known initial conditions would not license the inference to later states (Derbyshire 2016; Frigg and Smith 2022). We do not take this result as an objection but, rather, as a reinforcement: it is exactly for the reason that the settling of the present does not buy us the prediction that the mapping of a possibility space is a *different epistemic act* from the forecasting or the projecting of a trend. The contested-present feature matters for the construction of a possibility space not because the resolving of it would let us extrapolate, but because the choice of which present we reconstruct re-shapes the very *space* of futures that we are then mapping—that is, which of the modal layers are at all available, which domain inputs count as authoritative, and which alternatives become thinkable in the first place. The mapping is not the extrapolation, and the complexity literature, far from undermining the point, is in fact the very reason for which the distinction has to be drawn.

The reason that lies underneath is a causal one. The causal relations, on an interventionist understanding, are indexed to the actual systems: a generalization earns its explanatory standing by remaining invariant under interventions in some specific configuration of the world (Woodward 2003, 2021). To carry, then, a set of causal assumptions into a configuration that is not yet stabilized, or that is contested—which is exactly what any projection from a disputed present does—is a different act from the testing of those assumptions in a system that already exists and that holds still long enough to be probed. A word on the term is in order here, since it is easy to misread. When we speak of projecting a possibility space, we do not mean what a forecaster means by a projection—the extrapolation of a trend that carries the past forward while holding uncertainty to one side. We mean, rather, the carrying of a set of causal assumptions into a possible or contested configuration: a mapping under assumptions, and not a forecast. We have made, elsewhere, the analogous point for the historical and the counterfactual reasoning: the assessment of what would have followed, or of what could still follow, from a given antecedent, depends on the frameworks of assumed dependencies whose applicability is, in itself, a matter of judgment and not a given (Virmajoki 2023, 2024). The possibility space inherits this

judgmental character at its very base. This is the reason for which the contested-present feature belongs to the *object* itself, instead of being a mere problem of measurement to be cleared away before the real work can begin.

The contested-present feature is not peculiar to politics. Edwards's (2010) history of climate-knowledge infrastructure provides a clean worked example of how a “present” has to be assembled from data products that are themselves the result of extensive modeling: observational records become usable global data only after they are corrected, homogenized, and integrated through models, so that the “present state” of a system that is too large or too complex to be measured all at once tends to be a constructed object rather than a directly observed one. The same point applies, with appropriate domain-specific differences, to the present state of any cross-cutting phenomenon—a labor market, a health system, an electoral coalition, a research front—whose description has to be assembled before it can be projected forward.

Stanford's (2006) problem of unconceived alternatives reinforces the point at the level of theoretical commitments. Through case studies of 19th-century theories of inheritance, Stanford argues that scientific communities have repeatedly failed to conceive alternatives to their best-confirmed theories that were nonetheless available and that later supplanted accepted views. If our current reconstruction of the present is theory-laden in this way—a point that has been familiar at least since Kuhn (1970)—then the taking of it as the simple starting point for future projection is, probably, an act of considerable optimism. Possibility-space construction therefore involves choices about which reconstruction of the present to project from—and these choices are themselves part of what has to be studied.

3.4 | Reflexivity

The fourth feature is that accounts of the possibility space partly shape it. Expectations, visions, and scenarios feed back into the actions that bring about or fail to bring about the futures they describe.

That accounts of the future affect the future through human behavior has been pointed out at least since Popper (1957), whose critique of historicism warned against the treating of contingent trends as historical laws and showed that any “scientific” prophecy of the long-run course of human history must reckon with the fact that future knowledge cannot be predicted in advance from within the present. The entanglement is built into the core of futures research wherever the field is related to the purposes of emancipation and planning (Bell 1997; Marien 2002). The parallel focus on unexpected and unintended consequences is logical only if expected and intended consequences serve as the contrast. The reflexive structure is therefore not an exotic complication in special cases; it is, rather, a general feature.

Polak's (1973) analysis of “the image of the future” supplies one of the strongest articulations of this point. Polak argues that the images of the future held collectively by a civilization are primary drivers of its trajectory: a society with positive, aspirational

images of the future tends to flourish; one that loses the capacity to generate such images enters decline. Sen's (1992) capability framework can be read as reinforcing this from a normative direction by showing that what counts as a desirable future is itself a function of which functionings and freedoms a society regards as central. Recent work in science and technology studies has deepened the analysis: sociotechnical imaginaries co-produce the realities they describe (Jasanoff and Kim 2015), and the framework of responsible research and innovation treats anticipation, inclusion, reflexivity, and responsiveness as constitutive of well-functioning science-society relations (Stilgoe et al. 2013). Miller's work on futures literacy frames the same reciprocity in terms of capabilities: the capacity to use the future in the present is itself something that can be cultivated, and its cultivation changes the futures that come about.

Reflexivity here is not merely epistemic; it is also practical. The accounts that observers give of a possibility space change what actors do, and what actors do changes the possibility space. Energy-transition scenarios shape investment decisions that change the trajectory of the energy system; demographic projections inform pension and migration policy choices that themselves modify fertility, mobility, and the very demographic patterns the projections were trying to describe; and so on. This performative dimension has been examined in recent modeling debates, in which an account may help to bring about the future it describes or, in the limiting case of counter-performativity, undercut the very future it projects (Thompson 2022; Derbyshire et al. 2026). The possibility space cannot be specified independently of the accounts being given of it.

We should be careful here not to overclaim. Some special sciences have well-developed apparatus for the handling of reflexivity—economics has reflexivity traditions reaching back through Soros and earlier; performativity studies in sociology and finance have made the point at length; STS has institutionalized the analysis of co-production. The claim is, rather, more specific: for the special sciences whose *standing object* is causally independent of the descriptions given of it, reflexive methodology is an addition rather than a built-in feature; and for the disciplines that do incorporate reflexivity, the modal layering and multi-domain assembly the other features pick out are typically not part of their standing remit.

3.5 | The Four Features Are Inseparable

The four features of a possibility space—modal architecture, multi-domain composition, contested initial conditions, and reflexivity—are not independent properties that happen to co-occur. They are, we propose, features of one object: a possibility space is, in essence, the kind of thing whose modal layers, domain composition, contested presents, and reflexivity are inseparable.

The modal architecture cannot be studied without attending to the multi-domain composition, for the very reason that the credibility distinguishing plausible from merely possible futures depends on which domain inputs are taken as authoritative—and that depends on cross-domain judgments no single domain can make. The multi-domain composition cannot be studied

without attending to contested initial conditions, for the very reason that the assembly of domain inputs into a coherent picture of the present requires choices about which domain's account of the relevant present to privilege. Contested initial conditions cannot be studied without attending to reflexivity, for the very reason that how the present is reconstructed depends in part on what futures we expect, intend, or fear. And reflexivity feeds back into the modal architecture, for the very reason that the accounts shaping the future are themselves located within the modal layers—desirable futures are accounts that aim to shape what counts as desirable, alternative futures are accounts that question what currently counts as plausible; and so on.

In essence, the four features are aspects of one object. A study that handles only some of them is not, on the picture we are proposing, studying a possibility space. It is, rather, studying something else.

4 | Why No Special Science Studies This

If the four features of a possibility space are inseparable, the redundancy objection collapses. Special sciences study domain-internal phenomena under domain-specific commitments. They are not designed to study the modal layering of a multi-domain field projected from a contested present and partly constituted by accounts of itself. This is, in essence, not what they are. We are well aware that several adjacent enterprises take a possibility-object of their own as their subject of study; our claim is not that no field whatsoever studies the possibility, but only that none of the *home sciences* of the futures that are here in question studies *this* object—the modally typed, multi-domain, contested-present and reflexively shaped space—as a part of its standing remit.

This is the place at which the redundancy objection is, in its sharpest form, usually pressed. For one may grant everything that has just been said about the home sciences and still object that the possibility space is, after all, studied—only not by the futures studies. There is, by now, a dedicated journal, *Possibility Studies & Society*; in the economic geography an active literature on the “opportunity spaces” and on the cultures of possibility has developed (Huggins and Thompson 2025; Kurikka et al. 2023); the mathematics makes a separate object of the “state spaces”; and the risk analysis frames, more and more, its own work as the generation and the study of possibility spaces (Shafer 1976; Derbyshire 2026). If so many fields are already in the business of studying the possibility space, the objection runs, then a separate futures studies is, once again, redundant.

The objection, pressed in this form, trades on an equivocation, and it is worth the trouble to mark it as such. The redundancy worry, in its original and serious form, was the worry that the *home sciences of the futures in question*—the economics for the economic futures, the climate science for the climate futures, and so on—already cover the whole of the ground, so that nothing is left over for a separate field. To answer that worry by pointing to the possibility studies, or to the economic geography, or to the risk analysis, is to answer a different question from the one that was asked. None of these is the home science

of the futures whose redundancy was at issue; each of them is, on the contrary, itself a further independent field that had to be brought into existence for the very reason that the home sciences do not, from within, deliver the object. The objection slides, in other words, from “the possibility space is studied somewhere” to “the home sciences study it,” and these are not the same claim. It is, in essence, a red herring: the proliferation of the fields that study the possibility space is set out as though it told against a separate field, when it is in fact a recurrence of the very gap that the separate field was called into being to fill.

And here the proliferation is, rather, our evidence than our embarrassment. If the traditional sciences could take up the possibility space from within their standing remits, there would be no occasion for the possibility studies to constitute itself as a journal and a community, nor for the economic geography to coin its “opportunity spaces,” nor for the risk analysis to reframe its work around possibility, nor for the mathematics to make a separate object of its “state spaces.” That one and the same object keeps surfacing, again and again, in fields that have, on the face of it, nothing whatsoever to do with one another—and keeps being given, each time, a new name and approached from a new angle—is not a counterexample to the claim that the home sciences do not study it. It is, on the contrary, the cross-disciplinary corroboration of exactly that claim. The question that the original mystery asked—why an independent field is required at all, when every domain of life has its home science—is not laid to rest by these neighbors; it is, on the contrary, asked once more by their very existence. The mystery is not a local complaint that the futures studies makes about itself; it is a condition that is visible all over the map of the disciplines, and the independent field—or, more accurately, the independent fields, in the plural—is the recurring response to it.

We should be careful, here, not to overstate the unity. We do not say that the possibility studies, the opportunity-space literature, the state-space mathematics, and the futures studies are one and the same field under different names; that would be false, and the practitioners of each of them would, rightly, resist it. They are, rather, different angles on one object: the economic geography takes the possibility space under the aspect of the spatial and the regional opportunity, the risk analysis under the aspect of the representation of uncertainty, the mathematics under the aspect of the formal state-description, and the possibility studies under the aspect of the possible as such. What is distinctive about the futures studies, on the picture defended here, is not that it alone reaches for the object, but that it is the field which takes the object *whole*—under all four of the features at once, the modal architecture together with the multi-domain composition together with the contested initial conditions together with the reflexivity—and not under one favored aspect of it. Our claim, then, is not the proprietary one, that the possibility space belongs to the futures studies and to no one else. It is, rather, that the possibility space is a real object which the special sciences do not, from within, study, and that the studying of it requires a field, or fields, of a different kind; and the futures studies is the one among these that has the whole of the object as its proper remit.

The argument here is constitutive, not sociological. The claim is not that domain scientists could not, with sufficient effort and cross-disciplinary training, take on the task; some of them do,

and the ones who do are usually understood to be doing futures-studies-like work alongside their domain science. And when a home science does take the object up from within, the mystery does not dissolve but deepens, in the way set out at the very beginning of this paper: the work keeps having to be redone, under a new name, in field after field, and most special sciences are, simply, in another business—they touch the possibility space only in passing, as a departure from their standing remit and not as the thing they are for. The claim is, rather, that the *standing object* of any special science is not the possibility space. Climate science studies the climate system; economics studies economic activity; sociology studies social phenomena; and so on. Each of these objects is internal to its discipline and is studied under the discipline's characteristic methods, models, and standards of explanation—including, as Woodward (2003) interventionist account makes explicit, a sophisticated apparatus for the tracing of causal dependencies and for the assessing of how outcomes would change under interventions on the variables that matter to that domain. The possibility space, by contrast, is not internal to any of them. It is, rather, what arises when their outputs are assembled, modally typed, projected from a constructed present, and tracked for the way accounts of it shape it.

Climate projection illustrates the point even when one stays inside a single discipline. The work of producing climate projections is not a simple extension of climate science's standard subject matter: it involves (i) modeling choices that involve value judgments, (ii) the interpretation of model ensembles whose statistical foundations are contested, and (iii) the handling of structural model uncertainty that resists quantification. Even within a discipline that has spent decades developing the mathematical, observational, and computational infrastructure required for projection work, the move from the describing of the climate system to producing projections of its possible futures requires stepping into territory that the discipline's standing methods do not fully cover. The activity of producing projections inherits all four of the features identified in §3—(i) modal layering across confidence levels, (ii) integration of inputs from atmospheric physics and ocean dynamics and ecology and human-emissions scenarios, (iii) projection from contested reconstructions of present states, and (iv) reflexivity through the way scenarios shape policy that shapes emissions that shapes the future climate. If this is true within climate science—probably the discipline best equipped to do its own future projections—it is *a fortiori* true elsewhere. (For discussion, see, e.g., Stainforth et al. 2007; Biddle and Winsberg 2009; Parker 2009; Knutti et al. 2010; Winsberg 2012; Frigg et al. 2013; Intemann 2015).

5 | Two Consequences

Two further claims that have featured in defenses of futures studies are best understood as consequences of the central proposal rather than as parallel arguments for it. The first concerns normativity. The second concerns the field's reflexive self-understanding. We take them in that order.

5.1 | Normativity Is Constitutive, Not Added

A frequent worry about the treatment of futures studies as a science of possibilities is that science is supposed to be value-

neutral, while futures studies is unmistakably value-laden. Scenarios are evaluated as desirable or undesirable; trajectories are advocated for or warned against; and the language of “preferable futures” is, of course, a language that mixes the descriptive and the normative.

The framing of this worry, however, presupposes a separation between the descriptive and the normative that the structure of a possibility space does not respect. *Desirable* and *alternative* are proper modalities within the possibility space, on the same footing as *predictable* and *plausible*. They are not value-judgments imposed on a value-neutral structure; they are, rather, layers of the structure itself. A possibility space without a desirability layer is not a value-neutral possibility space; it is, rather, an incomplete description of a possibility space.

This way of thinking aligns with arguments about values in science that have accumulated over the past two decades. Douglas (2009) has shown that the value-free ideal cannot be sustained even within ordinary science, for the very reason that inductive risk decisions—choices about how to weigh the costs of different kinds of error—necessarily involve non-epistemic values. Longino (1990, 2002) has argued that values enter constitutively into theory choice through the underdetermination of theories by evidence, and has developed a contextual empiricist account on which objectivity is achieved socially. If values are constitutive even within ordinary science, the supposed scandal of value-laden futures research, in essence, evaporates. Futures research is more visibly value-laden than most special sciences for the very reason that its modal layers explicitly include desirability. The values are not an extra layer added to a value-free space; they are, rather, a feature of the space itself.

The diagnosis that follows is that the standard complaint about scenarios being “biased” by the values of those who construct them is misdirected. A possibility space that included no value-laden modalities would be one in which the desirability layer had been artificially stripped out—and that would be, probably, a worse description of the object, not a more objective one. The methodological task is therefore not to remove values from possibility-space construction but, rather, to be explicit about which values are doing what work in which layer of the space. Sen’s capability framework, with its question of *equality of what?*, is exactly the kind of explicit value-commitment that has to be made and defended rather than hidden.

5.2 | Reflexive Self-Understanding Is a Constitutive Activity

The second consequence concerns the place of *philosophy of futures studies* within the field. If a possibility space is partly constituted by the accounts that observers give of it, then a field whose object includes its own accounts requires reflexive self-understanding as part of its proper activity.

It is useful, here, to distinguish between *philosophy in futures studies* and *philosophy of futures studies*. By *philosophy in futures studies*, we mean the use of philosophical views and theories in the estimating of possible and desirable futures. In this sense, philosophy provides views and theories that are relevant to the

future in the same sense as other fields of research. By *philosophy of futures studies*, we mean the reflection on the nature, prospects, limits, and problems of and in futures studies—how futures studies works, what tensions the field faces, how the existing approaches can be justified, and what the conceptual core of the field is (Virmajoki 2026).

The picture defended in this paper makes the second of these activities—*philosophy of futures studies*—constitutive of the field rather than a parallel meta-discipline that some futures researchers happen to engage in. A possibility space includes the accounts of itself as part of its structure, and so the tracking of how those accounts work, how they are justified, and how they shape the space they describe is, in essence, one of the things futures studies has to do as part of its core work. This is why the canon of the field has always included reflexive contributions—Bell (1997) systematic treatment, Slaughter (1996) knowledge-base project, Inayatullah (1998) layered analysis, Voros (2003) framework, Miller (2018) futures-literacy program—alongside its more straightforwardly methodological contributions. These reflexive contributions are not an unusual feature of an unusual discipline. They are, rather, what is to be expected of a discipline whose object includes accounts of itself.

6 | A Division of Cognitive Labor

The picture defended here implies a particular division of cognitive labor between futures studies and the special sciences.

Special sciences provide substantive content, models, generalizations, and constraints. They tell us, with the authority of decades or centuries of accumulated work, what is going on within their domains and which dependencies—in Woodward (2003) terms—are stably explanatory and which are not. Their work is, of course, indispensable. A possibility space that did not respect the constraints supplied by ordinary science would not be a possibility space worth studying; it would be, rather, fantasy.

Futures studies, on the picture defended here, does something the special sciences do not: the field studies the possibility space these constraints jointly underdetermine. The work consists in (i) the modal layering of forward-looking inquiry, (ii) the integration of domain inputs whose mutual compatibility is not given, (iii) the assembly of contested presents into projection-ready reconstructions, and (iv) the tracing of the reflexive structure through which accounts of the future shape the future. None of this is in competition with the special sciences. It is, rather, work *on a different object*.

This is, in essence, the answer to the redundancy puzzle with which the paper began. The puzzle was: if every interesting future has a home discipline, why is there a separate field called futures studies? Our answer is that futures studies is not the home discipline of any future. It is, rather, the field that studies the possibility space within which the futures studied by the home disciplines are located. The two activities are, probably, complementary rather than redundant.

This also has implications for the methodological diversity of the field. Futures studies has often been criticized for the

heterogeneity of its methods. The picture defended here suggests, however, a different reading. The methods are heterogeneous for the very reason that they are addressing different aspects of a multi-aspect object: horizon scanning and weak-signal detection address the modal layering at its outer edges; Delphi and expert-elicitation methods address the multi-domain composition; backcasting and visioning, in the spirit of Hancock and Bezold's "preferable futures," address the desirability layer; and Causal Layered Analysis addresses the reflexive structure. The methodological pluralism is not a sign of immaturity. It is, rather, what is appropriate for a field whose object has the structure described in §3.

We want to close in the spirit in which we opened. We do not expect every futures researcher to agree with the proposal we have made; the field's identity has been worked over from many angles, and the answer offered here is one among several that could be defended. What we do hope is that the proposal is useful—that the naming of the *possibility space* as a possible proper object of futures studies, and the laying out of the four features that make it a distinctive object, gives the field a vocabulary in which the redundancy worry can be addressed without conceding that the worry is well-founded. Whether this answer fully demystifies the field is, probably, another question. But we hope that the redundancy worry that has dogged futures research loses its grip once the object is named, and that the further questions about how to study a possibility space will become the more interesting place for the field's energy to be directed.

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Endnotes

¹ As a helpful reviewer pointed out.

² To be explicit, for the sake of objectivity towards the ideas, one author of this paper has worked closely with Lukka on issues concerning scenarios, models, and performativity.

³ Formal apparatuses for the representation of possibility (and associated evidence, belief, and uncertainty) exist, of course—most notably the Dempster-Shafer evidence and belief-function theory (Shafer 1976) and the Potential Surprise Theory of G. L. S. Shackle (see Derbyshire 2026). These are complementary to the present argument, and not in competition with it: they offer formal languages for the *representation* of possibility, whereas our claim concerns the possibility space as the constitutive *object* of a field. We may note, in addition, that the

framework of Shackle, on the reading of Derbyshire, touches also on what we here call the reflexivity—the way in which a conception of the possibility space doubles back so as to remake the possibilities themselves—so that the overlap is one of which we are well aware, and not one that we overlook.

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