Hyperintensional Conceivability, Grounding, and Consciousness

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Abstract

This paper provides a rebuttal to the argument in Elohim (2018) in *Synthese*. Elohim provides a novel hyperintensional, ground-theoretic regimentation of the proposals in the metaphysics of consciousness. He then argues that Chalmers' (2010) intensional two-dimensional conceivability argument against physicalism is unsound, in light of the hyperintensional metaphysics of consciousness. Thus, intensional conceivability cannot be a guide to hyperintensional metaphysics. This paper demonstrates that a multi-hyperintensional version of epistemic two-dimensional semantics can be countenanced, and is sufficient for conceivability to be a guide to metaphysics in the hyperintensional setting such that Chalmers' argument, hyperintensionally construed, is in fact sound.

This paper provides a rebuttal to the argument presented in Elohim (2018) in *Synthese*. In that article, Elohim argues that a ground-theoretic regimentation of the proposals in the metaphysics of consciousness would entrain the result that Chalmers' (2010) two-dimensional intensional conceivability argument against physicalism is no longer sound. In this paper, I argue that the two-dimensional conceivability argument can yet be salvaged, if the epistemic two-dimensional semantics on which it relies is hyperintensionally construed in a different manner than via what Chalmers refers to as structured intensions. If so, then hyperintensional conceivability can in fact be a guide to hyperintensional metaphysics, and the conceivability of the class of physical truths not entailing the class of truths about consciousness can be a guide to its metaphysical possibility.

The two-dimensional intensional conceivability argument against physicalism proceeds as follows. Let P refer to the class of physical truths and Q refer to the class of truths concerning phenomenal consciousness. 'P $\wedge$ $\neg$Q' states that the class of truths about physics obtains without the class of truths about consciousness obtaining. 'P $\wedge$ $\neg$Q' can receive a truth value relative to two

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parameters, C and W. In two-dimensional semantics, the value of the formula relative to the first parameter determines the value of the formula relative to the second parameter. Let the first parameter range over a space of epistemic possibilities and let the second parameter range over a space of metaphysical possibilities. Then,

$[\![P \land \neg Q]\!]^{c,w} = 1$ iff $\exists c' \in C \exists w' \in W [\![P \land \neg Q]\!]^{c',w'} = 1$.

Chalmers' characterization of the argument proceeds as follows:

1. $P \land \neg Q$ is conceivable.
2. If $P \land \neg Q$ is conceivable, $P \land \neg Q$ is [epistemically, i.e.] 1-possible.
3. If $P \land \neg Q$ is 1-possible, $P \land \neg Q$ is [metaphysically, i.e.] 2-possible.
4. If $P \land \neg Q$ is 2-possible, then materialism is false.

Thus,

5. Materialism is false (2010: 149).

Line (3) is justified by the thought that the intensions, i.e. functions from worlds to extensions, for both P and Q are the same when the worlds are both epistemic and metaphysical. In his (2002) and (2010), Chalmers argues that 1-possibility entails 2-possibility, in the case when the primary and secondary intensions for physics and consciousness coincide. Primary intensions are functions from epistemically possible worlds to extensions, and secondary intensions are functions from metaphysically possible worlds to extensions. Thus, there is no gap between the epistemic and metaphysical profiles for expressions involving physics or consciousness, and the conceivability about scenarios concerning them will entail the 1-possibility and the 2-, i.e. metaphysical, possibility of those scenarios.

Chalmers provides two other conditions for the convergence between the epistemic and metaphysical profiles of expressions. In his (2002), epistemically possible worlds are analyzed as being centered metaphysically possible worlds, such that conceivability entails metaphysical (1-)possibility. The 1- and 2-intensions of an expression or formula can converge if they also satisfy the property of super-rigidity. Chalmers defines super-rigidity thus: 'When an expression is epistemically rigid and also metaphysically rigid (metaphysically rigid *de jure* rather than *de facto*, in the terminology of Kripke 1980), it is *super-rigid*' (Chalmers, 2012: 239). He writes: 'I accept Apriority/Necessity and Super-Rigid Scrutability. (Relatives of these theses play crucial roles in "The Two-Dimensional Argument against Materialism"' (241). The Apriority/Necessity Thesis is defined as the 'thesis that if a sentence S contains only super-rigid expressions, s is a priori iff S is necessary' (468), and Super-Rigid Scrutability is defined as the 'thesis that all truths are scrutable from super-rigid truths and indexical truths' (474). Super-rigidity can be replaced by the hyper-rigidity condition specified below, in hyperintensional contexts.

Elohim (2018) argues that the intensional two-dimensional conceivability argument is not at a fine enough level of grain to be a guide to the metaphysical profile of consciousness. Elohim (op. cit.) provides a novel ground-theoretic regimentation of the proposals in the metaphysics of consciousness which is hyperintensional. Elohim's argument is then that the two-dimensional conceivability argument is unsound because conceivability is intensional, whereas the metaphysics of consciousness is hyperintensional. Thus, intensional conceivability cannot be a guide to the hyperintensional metaphysics of consciousness.

The proposals in the metaphysics of consciousness are regimented in the hyperintensional ground-theoretic framework by Elohim as follows. Following Fine (2012a; 2012b), let a polyadic operator have a *ground-theoretic* interpretation, only if the profile induced by the interpretation concerns the hyperintensional *truth-making* connection between an antecedent set of truths or properties and the relevant consequent. Let a grounding operator be *weak* if and only if it induces reflexive grounding; i.e., if and only if it is sufficient for the provision of its own ground. A grounding operator is *strict* if and only if it is not weak. A grounding operator is *full* if and only if it uniquely provides the explanatory ground for a fact. A grounding operator is *part* if and only if it - along with other facts - provide the explanatory ground for a fusion of facts.

Combinations of the foregoing explanatory operators may also obtain: x < y iff ϕ is a *strict full* ground for ψ; x $\leq$ y iff ϕ is a *weak full* ground for ψ; x $\prec$ y iff ϕ is a *strict part* ground for ψ; x $\preceq$ y iff ϕ is a *weak part* ground for ψ; x $\preceq$ y $\wedge$ $\neg$(y $\preceq$ x) iff ϕ is a *strict partial* ground for ψ; x $\prec^*$ y iff x_1, ..., x_n $\leq$ y, iff ϕ is a *partial strict* ground for ψ; x $\prec$' z iff [$\phi \prec^* \psi \wedge \psi \preceq \mu$] iff ϕ is a *part strict* ground for some further fact, μ.

There is also the following proof-rule.

- Distributivity/Bijection:

  $\forall$x$\in$X, y$\in$Y

  [G[(... x ...)(... y ...)], s.t.

  f_{1-1}: $[x_1 \rightarrow y_1]$, ..., f_{1-1}: $[x_n \rightarrow y_n]$].

The ground-theoretic regimentation is as follows:

- Functionalism (modally: truths about consciousness are identical to truths about neuro- or psychofunctional role):

  Functional truths (F) ground truths about consciousness (Q) if and only if the grounding operator is:

  -strict full, s.t. F < Q

  -distributive (i.e. bijective between each truth-ground and grounded truth), s.t. $\exists f_{1-1}\langle$F, Q$\rangle$

- Phenomenal Realist Type Identity (modally: truths about consciousness are identical to truths about biological properties, yet phenomenal properties are – in some sense – non-reductively real).[1]

  Biological truths (B) ground truths about consciousness (Q) if and only if the grounding operator is:

[1] See, e.g., Smart (1959: 148-149), for an attempt to account for how phenomenal properties and biological properties can be identical, while phenomenal properties might yet have distinct higher-order properties.

-strict partial, s.t. $B \preceq Q \land \neg\, Q \preceq B$;

-distributive, s.t. $\exists f_{1-1}\langle B, Q\rangle$; and

-truths about consciousness are weak part (i.e. the set partly reflexively grounds itself), s.t. $Q \preceq Q$

- Property Dualism (modally: truths about consciousness are identical neither to functional nor biological truths, yet are necessitated by physical truths):

  Physical truths (P) ground truths about consciousness (Q) if and only if the grounding operator is:

  -$P \preceq Q$;

  -non-distributive, s.t. $\neg\exists f_{1-1}\langle P, Q\rangle$; and

  -truths about consciousness are weak part, s.t. $Q \preceq Q$

- Panpsychism (in Non-constitutive guise: Phenomenal properties are the intrinsic realizers of extrinsic functional properties and their roles; in Constitutive guise: (i) fundamental microphysical entities are functionally specified and they instantiate microphenomenal properties, where microphenomenal properties are the realizers of the fundamental microphysical entity's role/functional specification; and (ii) microphenomenal properties constitute the macrophenomenal properties of macrophysical entities):

  Truths about consciousness (Q) ground truths about functional role (F) if and only if the grounding operator is:

  -strict full, s.t. $Q < F$; and

  -non-distributive, s.t. $\neg\exists f_{1-1}\langle Q, F\rangle$

Hyperintensionality in Chalmers' epistemic two-dimensional intensional semantics can be countenanced via what he refers to as 'structured' intensions, i.e. intensions for each component expression of a sentence, rather than there being an intension for the sentence taken as a whole although the latter such intensions are still admissible (Chalmers, 2006). However, structured intensions capture a dimension of hyperintensionality which is sufficiently dissimilar from the hyperintensionality countenanced by the truthmaking interpretation of ground-theoretic operators such that it cannot redress the mismatch between the intensionalism in the conceivability argument and the hyperintensionality of the metaphysics of consciousness.

One dimension of hyperintensionality which it would be ideal to capture concerns sentences being true at parts of worlds rather than at whole worlds themselves. Thus, e.g., 'snow is white or it is not the case that snow is white' and 'grass is green or it is not the case that grass is green' are necessarily equivalent, but have different contents. In truthmaker semantics, this is owing to the two sentences being made true by different parts of worlds. These parts of worlds which verify and falsify sentences can thus be considered hyperintensional truthmakers and falsemakers (Fine, 2013, 2017,a-c).

Another dimension of hyperintensionality which it would be ideal to capture concerns subject matters. These subject matters are called topics in the literature, and capture the aboutness of atomic formulas. Thus, contents can be defined as pairs of intensions, i.e. functions from worlds to extensions, as well as topics which compose via mereological fusion (Berto, 2018, 2019; Canavotto et al, 2020; and Berto and Hawke, 2021).

In this paper, I will advance a version of epistemic two-dimensional semantics which is a truthmaker semantics and which is topic-sensitive.

According to truthmaker semantics for epistemic logic, a modalized state space model is a tuple $\langle$S, P, $\leq$, v$\rangle$, where S is a non-empty set of states, P is the subspace of possible states where states s and t comprise a fusion when s $\sqcup$ t$\in$P, $\leq$ is a partial order, and v: Prop $\rightarrow$ (2^S x 2^S) assigns a bilateral proposition $\langle p^+, p^- \rangle$ to each atom p$\in$Prop with p^+ and p^- incompatible (Fine 2017a,b; Hawke and Özgün, forthcoming: 10-11). Exact verification ($\vdash$) and exact falsification ($\dashv$) are recursively defined as follows (Fine, 2017a: 19; Hawke and Özgün, forthcoming: 11):

s $\vdash$ p if s$\in[\![p]\!]^+$

(s verifies p, if s is a truthmaker for p i.e. if s is in p's extension);

s $\dashv$ p if s$\in[\![p]\!]^-$

(s falsifies p, if s is a falsifier for p i.e. if s is in p's anti-extension);

s $\vdash \neg$p if s $\dashv$ p

(s verifies not p, if s falsifies p);

s $\dashv \neg$p if s $\vdash$ p

(s falsifies not p, if s verifies p);

s $\vdash$ p $\wedge$ q if $\exists$t,u, t $\vdash$ p, u $\vdash$ q, and s = t $\sqcup$ u

(s verifies p and q, if s is the fusion of states, t and u, t verifies p, and u verifies q);

s $\dashv$ p $\wedge$ q if s $\dashv$ p or s $\dashv$ q

(s falsifies p and q, if s falsifies p or s falsifies q);

s $\vdash$ p $\vee$ q if s $\vdash$ p or s $\vdash$ q

(s verifies p or q, if s verifies p or s verifies q);

s $\dashv$ p $\vee$ q if $\exists$t,u, t $\dashv$ p, u $\dashv$ q, and s = t $\sqcup$ u

(s falsifies p or q, if s is the fusion of the states t and u, t falsifies p, and u falsifies q);

s $\vdash \forall$xϕ(x) if $\exists s_1, \ldots, s_n$, with $s_1 \vdash \phi(a_1), \ldots, s_n \vdash \phi(a_n)$, and s = $s_1 \sqcup \ldots \sqcup s_n$

[s verifies $\forall$xϕ(x) "if it is the fusion of verifiers of its instances $\phi(a_1), \ldots, \phi(a_n)$" (Fine, 2017c)];

s $\dashv \forall$xϕ(x) if s $\dashv \phi$(a) for some individual a in a domain of individuals (op. cit.)

[s falsifies $\forall$xϕ(x) "if it falsifies one of its instances" (op. cit.)];

s $\vdash \exists$xϕ(x) if s $\vdash \phi$(a) for some individual a in a domain of individuals (op. cit.)

[s verifies $\exists x\phi(x)$ "if it verifies one of its instances $\phi(a_1)$, ..., $\phi(a_n)$" (op. cit.)];

s $\dashv \exists x\phi(x)$ if $\exists s_1, \ldots, s_n$, with $s_1 \dashv \phi(a_1), \ldots, s_n \dashv \phi(a_n)$, and $s = s_1 \sqcup \ldots \sqcup s_n$ (op. cit.)

[s falsifies $\exists x\phi(x)$ "if it is the fusion of falsifiers of its instances" (op. cit.)];

s exactly verifies p if and only if s $\vdash$ p if s$\in[\![p]\!]$;

s inexactly verifies p if and only if s $\triangleright$ p if $\exists$s'$\leq$S, s' $\vdash$ p; and

s loosely verifies p if and only if, $\forall$t, s.t. s $\sqcup$ t $\vdash$ p, where $\sqcup$ is the relation of compatibility (35-36);

s $\vdash$ Aϕ if and only if for all t$\in$P there is a t'$\in$P such that t' $\sqcup$ t$\in$P and t' $\vdash$ ϕ, where Aϕ denotes the apriority of ϕ; and

s $\dashv$ Aϕ if and only if there is a t$\in$P such that for all u$\in$P either t $\sqcup$ u$\notin$P or u $\dashv$ ϕ.

In order to account for two-dimensional indexing, we augment the model, M, with a second state space, S*, on which we define both a new parthood relation, $\leq$*, and partial function, V*, which serves to map propositions in a domain, D, to pairs of subsets of S*, {1,0}, i.e. the verifier and falsifier of p, such that $[\![P]\!]^+ = 1$ and $[\![p]\!]^- = 0$. Thus, M = $\langle$S, S*, D, $\leq$, $\leq$*, V, V*$\rangle$. The two-dimensional hyperintensional profile of propositions may then be recorded by defining the value of p relative to two parameters, c,i: c ranges over subsets of S, and i ranges over subsets of S*.

(*) M,s$\in$S,s*$\in$S* $\vdash$ p iff:
(i) $\exists c_s[\![p]\!]^{c,c} = 1$ if s$\in[\![p]\!]^+$; and
(ii) $\exists i_{s*}[\![p]\!]^{c,i} = 1$ if s*$\in[\![p]\!]^+$

(Distinct states, s,s*, from distinct state spaces, S,S*, provide a multi-dimensional verification for a proposition, p, if the value of p is provided a truthmaker by s. The value of p as verified by s determines the value of p as verified by s*).

We say that p is hyper-rigid iff:

(**) M,s$\in$S,s*$\in$S* $\vdash$ p iff:
(i) $\forall c'_s[\![p]\!]^{c,c'} = 1$ if s$\in[\![p]\!]^+$; and
(ii) $\forall i_{s*}[\![p]\!]^{c,i} = 1$ if s*$\in[\![p]\!]^+$

The foregoing provides a two-dimensional hyperintensional semantic framework within which to interpret the values of a proposition:

s is a two-dimensional exact truthmaker of p if and only if (*);

s is a two-dimensional inexact truthmaker of p if and only if $\exists$s'$\leq$S, s$\rightarrow$ s', s' $\vdash$ p and such that

$\exists c_{s'}[\![p]\!]^{c,c} = 1$ if s'$\in[\![p]\!]^+$, and

$\exists i_{s*}[\![p]\!]^{c,i} = 1$ if s*$\in[\![p]\!]^+$;

s is a two-dimensional loose truthmaker of p if and only if, $\exists$t, s.t. s $\sqcup$ t, s $\sqcup$ t $\vdash$ p:

$\exists c_{s\sqcup t}[\![p]\!]^{c,c} = 1$ if s'$\in[\![p]\!]^+$, and

$\exists i_{s*}[\![p]\!]^{c,i} = 1$ if s*$\in[\![p]\!]^+$.

Epistemic (primary), subjunctive (secondary), and 2D hyperintensions can be defined as follows, where hyperintensions are functions from states to extensions, and intensions are functions from worlds to extensions:

- Epistemic Hyperintension:
  $\texttt{pri}(x) = \lambda s.[\![x]\!]^{s,s}$, with s a state in an epistemic state space;
- Subjunctive Hyperintension:
  $\texttt{sec}_{v_@}(x) = \lambda i.[\![x]\!]^{v_@,i}$, with i a state in metaphysical state space I;
- 2D-Hyperintension:
  $\texttt{2D}(x) = \lambda s \lambda i [\![\mathrm{x}]\!]^{s,i} = 1$.

If a formula is two-dimensional and the two parameters for the formula range over distinct spaces, then there won't be only one subject matter for the formula, because total subject matters are construed as sets of verifiers and falsifiers and there will be distinct verifiers and falsifiers relative to each space over which each parameter ranges. This is especially clear if one space is interpreted epistemically and another is interpreted metaphysically. Availing of topics, i.e. subject matters, however, and assigning the same topics to each of the states from the distinct spaces relative to which the formula gets its value is one way of ensuring that the two-dimensional formula has a single subject matter.

Following the presentation of topic models in Berto (op. cit.), atomic topics comprising a set of topics, T, record the hyperintensional intentional content of atomic formulas, i.e. what the atomic formulas are about at a hyperintensional level. Topic fusion is a binary operation, such that for all x, y, z∈T, the following properties are satisfied: idempotence (x ⊕ x = x), commutativity (x ⊕ y = y ⊕ x), and associativity [(x ⊕ y) ⊕ z = x ⊕ (y ⊕ z)] (Berto, 2018: 5). Topic parthood is a partial order, ≤, defined as ∀x,y∈T(x ≤ y $\iff$ x ⊕ y = y) (op. cit.: 5-6). Atomic topics are defined as follows: Atom(x) $\iff$ ¬∃y < x, with < a strict order. Topic parthood is thus a partial ordering such that, for all x, y, z∈T, the following properties are satisfied: reflexivity (x ≤ x), antisymmetry (x ≤ y ∧ y ≤ x → x = y), and transitivity (x ≤ y ∧ y ≤ z → x ≤ z) (6). A topic frame can then be defined as {W, R, T, ⊕, t}, with t a function assigning atomic topics to atomic formulas. For formulas, ϕ, atomic formulas, p, q, r (p_1, p_2, ...), and a set of atomic topics, U$t\phi$ = {p_1, ... p_n}, the topic of ϕ, t(ϕ) = ⊕U$t\phi$ = t(p_1) ⊕ ... ⊕ t(p_n) (op. cit.). Topics are hyperintensional, though not as fine-grained as syntax. Thus $t(\phi) = t(\neg\neg\phi)$, $t\phi = t(\neg\phi)$, $t(\phi \wedge \psi) = t(\phi) \oplus t(\psi) = t(\phi \vee \psi)$ (op. cit.).

The diamond and box modal operators can then be defined relative to topics:
$\langle$M,w$\rangle \Vdash \Diamond^t\phi$ iff $\langle R_{w,t}\rangle(\phi)$
$\langle$M,w$\rangle \Vdash \Box^t\phi$ iff $[R_{w,t}](\phi)$, with
$\langle R_{w,t}\rangle(\phi)$:= {w'∈Wt'∈T | $R_{w,t}$[w', t'] ∪ $\phi \neq \emptyset$ and t'(ϕ) ≤ t(ϕ)}
$[R_{w,t}](\phi)$:= {w'∈Wt'∈T | $R_{w,t}$[w', t'] ⊆ ϕ and t'(ϕ) ≤ t(ϕ).

We can then combine topics with truthmakers rather than worlds, thus countenancing a multi-hyperintensional semantics, i.e. topic-sensitive epistemic two-dimensional truthmaker semantics:

- Epistemic Hyperintension:
  $\texttt{pri}_t(x) = \lambda s \lambda \mathrm{t}.[\![x]\!]^{s \cap t, s \cap t}$, with s a truthmaker from an epistemic state space.
- Subjunctive Hyperintension:
  $\texttt{sec}_{v_@ \cap t}(\mathrm{x}) = \lambda w \lambda \mathrm{t}.[\![x]\!]^{v_@ \cap t, w \cap t}$, with w a truthmaker from a metaphysical state space.
- 2D-Hyperintension:
  $\texttt{2D}(x) = \lambda s \lambda w \lambda \mathrm{t} [\![\mathrm{x}]\!]^{s \cap t, w \cap t} = 1$.

Topic-sensitive epistemic two-dimensional truthmaker semantics provides a multi-hyperintensional framework sufficient to redress Elohim (op. cit.)'s argument. Because conceivability is no longer intensionally construed, but rather hyperintensionally construed via topics and truthmakers, and truthmakers in particular can capture the grounding operations of phenomenal facts on physical facts in Elohim's ground-theoretic regimentation, the hyperintensional conceivability of truths about the relations between physics and consciousness can be a guide to the hyperintensional metaphysics concerning the relations between physics and consciousness. The framework can generalize to account for how conceivability can be a guide to metaphysical possibility whenever the propositions at issue are hyperintensionally construed. The foregoing demonstrates, however, that multi-hyperintensional epistemic two-dimensional semantics provides a framework which can witness the soundness of the two-dimensional conceivability argument against physicalism.

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