

Semantic gaps and protosemantics

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A ‘semantic gap’ divides two regions of language when the meanings on the one side are very different from those the other. The gap considered here divides language about the physical (quotidian or scientific, classical or quantum alike) from language about the mental—as discussed in an extensive philosophical literature over the last half-century (perhaps continuously with much older literature), which attempts to establish its existence and interpret its significance. To my mind, the gap (if perhaps not each of its alleged manifestations) genuinely exists, but the literature misinterprets its significance.

The source is a pervasive, but fundamentally mistaken assumption regarding the ‘protosemantical’ issue of what meaning *is* (essentially or fundamentally): roughly, meaning is assumed to be *representation* (depiction, description, information); sharpening, a theory of meaning is assumed to be ineliminably a theory of *truth-conditions* imposed on *the world*. While pervasive and venerable, the assumption is at best viable in a local special case, at worst a gross oversimplification resulting from a misunderstanding of that special case—or, at any rate, it is surely *optional*. For on a viable alternative, meaning is, roughly, *expression* (display, commitment, articulation); sharpening, a theory of meaning is ineliminably a theory of *endorsement-conditions* imposed on *our mental states*.

Endorsement-conditionalism relocates the ‘perspective’ of meaning from the world to the mind, marking a radical departure from our tradition’s long-hegemonic truth-conditionalism (but also from a far older broadly ‘scientific’ outlook, over-emphasizing ‘objectivity’ and downplaying ‘empathy’). Theory of meaning benefits extensively; even better, the startup cost is minimized by extensive continuity with central truth-conditionalist apparatus. Significant for present purposes, though, is the very different take it offers on semantic gap phenomena: to my mind, a strongly preferable one, free from the spectres of dualism, epiphenomenalism, and a disintegrating ‘separatist’ image of mind.

Section 1 sketches the various semantic gap phenomena—the ‘explanatory gap’; the ‘epistemic gap’ (exemplified by ‘Black-and-White Mary’); the ‘suppositional gap’ (exemplified by the alleged ‘conceivability’ of zombies). Section 2 gives the sense in which these are ‘semantic’, by connecting them to *logical consequence* and thence *meaning*; sketches up a more-or-less state of the art framework for truth-conditionalist semantics; and with it extracts from the semantic gap phenomena various *dispiriting consequences* (antiphysicalism; epiphenomenalism; ‘separatism’). Section 3 sketches the endorsement-conditionalist alternative, and implements an ‘expressivist’ analysis of mental sentences in close alliance with ‘simulationism’ (on which reasoning about the mental involves ‘empathy’, analyzed here as akin to *supposition*). Section 4 offers the endorsement-conditionalist take on the semantic gaps: first, the ‘expressivism’ blocks the *dispiriting consequences*; second, various details of the account are used to analyze the various semantic gap phenomena—in particular, epistemic gaps are traced to imperfections of empathy; the ‘triviality’ behind endorsement-conditionalism severs the path from epistemic to suppositional gaps, and both zombies and inverts are shown to be inconceivable; and the explanatory gap is traced to an essential ‘viewpoint-shift’ between reasoning about the physical and about the mental.

1 Semantic gap phenomena

Various (purported—to avoid archness, the qualification is left tacit through this section) semantic gap phenomena have been canvassed in recent literature (some, perhaps, continuous with older discussion): adapting the overview/systematization in [Chalmers 2002a](#), 3.1–3.3,¹ I sketch three distinctive exemplars.

A *first* semantic gap phenomenon is the *explanatory gap*, involving mental facts left unexplained (in a ‘constitutive’ sense) by the totality of physical fact. An early statement is Leibniz’s famous ‘mill’ example:

[P]erception and that which depends upon it are inexplicable on mechanical grounds, that is to say, by means of figures and motions. And supposing there were a machine, so constructed as to think, feel, and have perception, it might be conceived as increased in size, while keeping the same proportions, so that one might go into it as into a mill. That being so, we should, on examining its interior, find only parts which work one upon another, and never anything by which to explain a perception. ([Leibniz 1714/1991](#), 17)

Contemporary discussion of the explanatory gap is initiated (and its name bestowed) by [Levine \(1983\)](#), who observes that ‘what is left unexplained by the discovery of C-fiber firing is *why pain should feel the way it does!* For there seems to be nothing about C-fiber firing which makes it naturally ‘fit’ the phenomenal properties of pain, any more than it would fit some other set of phenomenal properties’ (357); the explanatory gap is central to Chalmers’s early paper (‘why should physical processing give rise to a rich inner life at all? It seems objectively unreasonable that it should’: [Chalmers 1995](#), 5) announcing the ‘hard problem’ of resolving the follow-on explanatory challenge. Chalmers’s overview puts it this way: ‘even once one has an explanation of all the relevant functions in the vicinity of consciousness—discrimination, integration, access, report, control—there may still remain a further question: why is the performance of these functions accompanied by experience?’ ([Chalmers 2002a](#), 248).

Second is the *epistemic gap*, involving mental facts for knowledge of which knowledge of the totality of physical fact is insufficient. A relatively early statement is Broad’s discussion of a ‘mathematical archangel’:

He [the archangel] would know exactly what the microscopic structure of ammonia must be; but he would be totally unable to predict that a substance with this structure must smell as ammonia does when it gets into the human nose. The utmost that he could predict on this subject would be that certain changes would take place in the mucous membrane, the olfactory nerves and so on. But he could not possibly know that these changes would be accompanied by the appearance of a smell in general or of the peculiar smell of ammonia in particular, unless someone told him so or he had smelled it for himself. ([Broad 1925](#), 71)

Contemporary literature contains two particularly high-profile discussions: [Nagel \(1974\)](#) bemoans that, although ‘I want to know what it is like for a *bat* to be a bat’ (439), barriers well beyond mere physical ignorance impede his satisfaction; [Jackson \(1982\)](#) introduces ‘Black-and-White Mary’, the color scientist trapped for life in a monochrome environment: released to see color, ‘it is just obvious that she will learn something[]. But then [] her previous knowledge was incomplete. But she had *all* the physical information’ (130). Chalmers’s overview affirms Jackson’s assessment:

¹Terminology diverges somewhat: Chalmers discusses an ‘explanatory argument’, a ‘conceivability argument’, and a ‘knowledge argument’, grouping my semantic gaps as ‘epistemic gaps’—somewhat inappositely, as ‘conceivability’ (and to some extent, ‘explanation’) is obscurely related to the ‘epistemic’, while ‘knowledge’ seems to exhaust it.

‘Despite all her knowledge, [] Mary [] does not know what it is like to see red. Even complete physical knowledge and unrestricted powers of deduction do not enable her to know this’ (Chalmers 2002a, 250).

Third is the *suppositional gap*, involving mental facts coherently supposed absent despite preserving the totality of physical fact. An early statement is Descartes’s claim that ‘while I could pretend that I had no body and that there was no world and no place for me to be in, I could not for all that pretend that I did not exist’ (Descartes 1637/1985, 127). Contemporary literature favors the opposite direction of independence: ‘Descartes’s argument also has the following turned-around version, which to my knowledge he never employed. The existence of the body without the mind is just as conceivable as the existence of the mind without the body’ (Nagel 1970, 401); compare also Kripke 1972/1980, 148–54. Chalmers’s overview relays such reports: where a ‘zombie’ is ‘a system that is physically identical to a conscious being but that lacks consciousness entirely’, ‘many hold that [] we can coherently imagine zombies, and there is no contradiction in the idea that reveals itself even on reflection’ (Chalmers 2002a, 249; a similar point is made for ‘inverts’, possessing consciousness, but of a very different sort than corresponding actual subjects).

2 Semantic gaps as truth-conditional gaps

I call these *semantic* gaps, because each of the involved phenomena—explanatory completeness; the transmission of knowledge; constraints on supposition—is closely related to phenomena of meaning. Starting from the *meaning* side of the relation, note that, very plausibly, the meanings of a set of ‘premiss’ sentences and a ‘conclusion’ sentences entirely determine whether the premisses *entail* the conclusion (have it as a ‘logical consequence’). Next, consider the notion of *endorsing* a sentence, understood as carrying an ‘implicit commitment’ to ‘accept’ the sentence (because of the meaning the sentence has for one and the specifics of one’s mental state). Note last that each of these equivalences is quite plausible:

- I. φ entails ψ just if endorsing φ requires endorsing ψ (on pain of unintelligibility)
- II. Endorsing φ requires endorsing ψ just if:
 - A. Granting φ forecloses *wondering why* (seeking any further explanation for) ψ
 - B. *Knowing* φ (endorsing φ ‘with knowledge’) requires knowing ψ
 - C. *Supposing* φ (endorsing φ within a suppositional state) requires supposing ψ

An explanatory, epistemic, or suppositional gap, by (II), exists just in the presence of an ‘endorsement gap’; by (I), this exists just in the absence of entailment; and the presence or absence of entailment, as noted, is entirely determined by (certain facts about) meaning: so the various gaps follow in lockstep with those facts about meaning (whatever they may be)—making them manifestations of an underlying *semantic* gap.

A systematic account and evaluation of the various gaps therefore requires understanding those underlying facts about meaning—calling quite naturally for a turn to theory of meaning. Philosophical literature has for a half-century accorded paradigm status to *truth-conditional* theories of meaning, making it helpful to review certain important but intricate details of the internal structure of such theories. The founding idea is the Frege-Tarski analysis of logical consequence as the preservation of truth under all conditions—a set of premisses Ψ entails a conclusion φ just if for

any condition, if every member of Ψ is true in that condition, then φ is also true in that condition. Because, moreover, facts about entailment flow exhaustively from facts about meaning, the meaning of a sentence must determine the conditions under which it is true; and hence a theory of meaning for a language must state the truth-conditions of its sentences.

A long shadow is still cast by Davidson's early implementation (Davidson 1967): it has two key components. First, sentence-meanings are portrayed with *T-sentences*, disquotational biconditionals stating truth-conditions: '*goats eat cans*' is true just if *goats eat cans*; or, more flexibly, '*it rains*' is true relative to condition *k* just if *it rains in condition k*. Second, a core explanatory ambition is *compositionality*, with the meaning of a complex expression determined by the meanings of its constituents—so by the first component, whenever φ and ψ share a truth-condition (their T-sentences share a right hand side), then so do any sentences $\Phi(\varphi)$ and $\Phi(\psi)$ differing only in intersubstitution of φ and ψ .

This early implementation is inadequate. Observe that it rules out pairs of logically equivalent sentences φ and ψ with some inequivalent $\Phi(\varphi)$ and $\Phi(\psi)$: by the Frege-Tarski basis, logical equivalence is identity of truth-condition, so equivalent φ and ψ share a truth-condition; so, by compositionality, so do any $\Phi(\varphi)$ and $\Phi(\psi)$; so by the Frege-Tarski basis, $\Phi(\varphi)$ and $\Phi(\psi)$ are likewise equivalent. Unfortunately, such pairs appear to exist (or at least theory should make room for them)—canonically, *it rains* and *now, it rains* are equivalent; *always, it rains* and *always, now, it rains*, inequivalent (locus classicus: Kamp 1971).

One repair distinguishes *compositional* from *logical* truth-conditions (if the latter abstract from the former, φ and ψ can share logical but not compositional truth-conditions, lifting the requirement that $\Phi(\varphi)$ and $\Phi(\psi)$ share compositional truth-conditions or therefore logical truth-conditions). Unfortunately, yet a third notion of 'truth-condition' is required upon expanding the 'client base' for theory of meaning beyond logic, to include *pragmatics* (concerned with the use of sentences in assertions to convey information, or with stative attitudes toward sentences, particularly *endorsement*, to 'package' information for eventual use in assertion or reasoning). After all, compositionally distinct sentences (for example, *it rains* and *now, it rains*) can invariably convey the same information—so the compositional truth-condition is distinct from any 'pragmatical truth-condition'. But such a 'pragmatical truth-condition' is also distinct from the logical truth-condition, for logically equivalent sentences can convey distinct information (canonically, just as *either (always, now, it rains) or (always, it is not the case that now, it rains)* is valid, so too is *either (necessarily, actually, it rains) or (necessarily, it is not the case that actually, it rains)*—namely, *it is noncontingent whether actually, it rains* is valid: and if so, *actually, it rains* should invariably convey noncontingent information; but *it rains* invariably conveys contingent information; and yet *it rains* and *actually, it rains* are logically equivalent).

The mutual relevance of these proliferating truth-conditions is resolved in a *Standard Framework* developed over the course of the 1970s (Lewis 1970, Stalnaker 1970, Kaplan 1977, Stalnaker 1978, Lewis 1980):

- S1. 'Compositional truth-conditions' for sentences are replaced with a more general notion of the *semantic value* of an expression: an abstract entity assigned to a simple expression by the meaning-bestowing conventions of language and to a complex expression by the composition of semantic values of its constituent expressions;
- S2. 'Pragmatical truth-conditions' are replaced with a more general notion of the *propositional content* of an assertion (or stative sentential attitude), representing the *increment of information* it conveys (or stores): propositional content is connected to semantic value by (a)

positing an array of *contexts* (representing concrete situations of speech or reasoning), and (b) requiring that an assertion using a certain sentence φ taking place in a context c (or an attitude held toward φ by the inhabitant of a context c) be assigned a proposition $\varphi(c)$ determined by c and the semantic value of φ ;²

S3T. Logical consequence remains *truth-preservation*, with ‘logical truth-conditions’ analyzed by relating contexts and propositions to *possible worlds*:

- (a) Contexts are interpreted as ‘possible locations’ and represented as *centered possible worlds*, with a context c severally determining and collectively determined by a possible world w_c , moment of time t_c , and individual agent a_c ;
- (b) Propositions are analyzed as (determining) *possible-worlds truth-conditions*;

The sentence φ is then *true in a context c* just if the proposition $\varphi(c)$ is true in the contextually actual world w_c —so that premisses Ψ entail a conclusion φ just if for every context c : if (for every $\psi \in \Psi$, $\psi(c)$ is true in w_c), then $\varphi(c)$ is true in w_c .

Return now to the various semantic gaps: by (II), each involves a true mental sentence ψ^\dagger such that for every true physical sentence φ , endorsing φ without ψ^\dagger is intelligible; so, by (I), this ψ^\dagger is not entailed by any such φ ; so, by (S3T), for this ψ^\dagger and any such φ , there is some context c^\dagger such that $\varphi(c^\dagger)$ is true in w_{c^\dagger} but $\psi^\dagger(c^\dagger)$ is false in w_{c^\dagger} . But then the contextual truth-value of ψ^\dagger is underdetermined by that of any physical truth φ (after all, both φ and ψ^\dagger are *true* (recall), providing a context—namely, *our* context, c^* —such that both $\varphi(c^*)$ and $\psi^\dagger(c^*)$ are true in c^*).³

The contextual truth-value underdetermination of some mental truth by any physical truth yields a progression of *dispiriting consequences*:

- *Nonphysicalist metaphysics*: both the mental truth ψ^\dagger and every physical truth φ are, of course, true in our context c^* : but a context c^\dagger with every such φ still true but ψ^\dagger false is perhaps (Chalmers 2010b, 146) a possibility that *we* be such that these φ are true but ψ^\dagger is false—so at least how *we are* physically underdetermines how *we are* mentally.

Say that a sentence is *intra-world-insensitive* just if whenever contexts c and c' share an actual world, they assign the sentence the same truth-value; otherwise *intra-world-sensitive*. Perhaps such intra-world-sensitivity in ψ^\dagger is not required by the semantic gap (Chalmers 2010b, 163); perhaps the gap survives its explicit suppression (Chalmers 2010b, 162). If so, ψ^\dagger is false in the world w^\dagger of c^\dagger but true in the world @ of our context c^* , despite the truth in both w^\dagger and @ of every intra-world-insensitive physical truth φ : so how *the world is* physically underdetermines how *the world is* mentally.

Last, say that a sentence φ is *context-insensitive* just if for any contexts c and c' , $\varphi(c) = \varphi(c')$. Perhaps context-sensitivity in ψ^\dagger is not required by the semantic gap: then there is some proposition q^\dagger such that invariably $q^\dagger = \psi^\dagger(c)$; and for every proposition p which is the content of some true context-insensitive physical sentence, the possible-worlds truth-value

²The initial case for pragmatical truth-conditions shows that this determination cannot be compositional: rather, contribution from a ‘postsemantic’ stage is required.

³A consequence of (S3T) and right-to-left (I) and (II-C) is (a certain interpretation of) Chalmers’s CP: ‘if ψ is conceivable, ψ is 1-possible’ (Chalmers 2010b, 166, renotated). Let ψ be such that (*) some φ does not transmit supposition to not- ψ ; then by (II-C), some φ does not transmit endorsement to not- ψ ; then by (I), some φ does not entail not- ψ ; then by (S3T), ψ is true in some context. CP follows, interpreting ‘conceivability’ with (*) and ‘1-possibility’ with truth in some context.

of p underdetermines that of q^\dagger (Chalmers 2010b, 149).⁴ On a familiar interpretation (Kripke 1972/1980, 153–4), at least some mental facts are ‘superadded’ to the physical facts—to ‘make the world’, God did not stop after making its physical aspect.

- *Epiphenomenalism*: if nonphysicalism is discomfiting already,⁵ worse is to follow. If certain mental facts are even *apparently* superadded to the physical facts,⁶ this undercuts the legitimacy of ‘diachronic’ explanations running between such facts and the physical facts. Many of us are convinced that physics is ‘causally closed’ (compare Lewis 1966, 105): when God made the physical aspect of the world, this completed the dossier of facts about the causal impingements on (and perhaps *by*) the physical aspect of the world; if there was a subsequent mental superaddition, it involved no further contribution of causal impingements on (or perhaps *by*) the physical. But this requires denying any superadded mental facts the power to causally impinge on (or perhaps be impinged upon by) the physical.

Unfortunately, in merely forming an intention to set ourselves a reminder alarm to phone Mom, we seem to ‘presuppose’⁷ that forming the intention (mental) will be somehow responsible for a later setting of the alarm (physical), which will in turn be somehow responsible for a still later forming of an intention to phone Mom (mental). If this ‘responsibility’ is causal, our presupposition is incompatible with the assumed superaddition of the involved mental facts. ‘Noncausal responsibility’, though, is hard to understand (Davidson 1963);⁸ and yet without it, we may be torn between *practical* reason (which demands we presuppose mutual responsibility between mental and physical facts) *theoretical* reason (which demands we not contradict ourselves).

- *Separatism*: over the 1970s, popularity massed behind a strategy of avoiding contradiction by separating a ‘responsible but gapless’ *functional* understanding of the mental, from a ‘gappy but irresponsible’ *phenomenal* understanding (compare Shoemaker 1975, Jackson 1977; and especially Fodor 1991, 12 on ‘dividing and conquering’).

Unfortunately, this separatism seems unlikely to get off the ground: my ordinary, first-person understanding of my own mental life is simultaneously *both* gap-creating and used in presupposing responsibility.⁹ Perhaps we must choose between practical and theoretical reason,

⁴To save space, yet further complications from the prospect of inevitable context-sensitivity are suppressed: compare Chalmers 2010b, 150–52—but the ‘Russellian monism’ emerging here is vulnerable to ‘conceivability of the mind without the body’ (Nagel 1970, 401, repeating from above).

⁵Compare: ‘the antecedent impulse to believe materialism [is] so strong (I share it, too), and my conclusions so hard to accept’ (Chalmers 1999, 3.6).

⁶Perhaps, contrary to ‘modal rationalism’ (Chalmers 2010b, section 10), the underdetermination goes for ‘merely epistemic’ possible worlds: if this blocks the case against physicalism, the current worry yet remains intact.

⁷Compare Fodor 1989, 77: ‘If it isn’t literally true that my wanting is causally responsible for my reaching, and my itching is causally responsible for my scratching, and my believing is causally responsible for my saying ... if none of that is literally true, then practically everything I believe about anything is false and it’s the end of the world’.

⁸Particularly so, for truth-conditionalists; less so for endorsement-conditionalists—as per below (and Hellie 2018b).

⁹The complaint fast-marches a slowly evolving dialectic from the literature. Toward the end of the 1980s, the elusiveness of any nonexplanatory ‘phenomenal’ understanding would provoke widespread dissatisfaction (paradigmatically, the concept *red* applies to external surfaces; the concept *looks red*, if mental, has explanatory power, making it ‘functional’; the concept *phenomenal red*, if distinct from these others, does not apply to anything easily identified: compare Dennett 1988, Lewis 1988b), mounting to rebellion by the early 1990s (Harman 1990).

By the mid-2000s, *nonreductive representationalism* (*phenomenal red* is a distinctively ‘phenomenal’ sense of *looks red*: compare Chalmers 2004b) had emerged to soothe the elusiveness worry: apparently, by subdividing the ‘functional’ into the ‘representational’ and the ‘explanatory’ and folding the ‘phenomenal’ in with the former: the pre-

after all!

3 Endorsement-conditionalism

Fortunately, the choice is not forced, but rather a creature of theory—specifically, of protosemantics. We may therefore avoid it through protosemantic revision: abandoning *truth* as the fundamental relation of meaning, in favor of *endorsement*. This marks a drastic recentering of the theory of meaning, from the world to the mind: whether ‘goats eat cans’ is *true* is constant among subjects sharing the same actual world, and varies among worlds only in accord with how things are in those worlds; whether ‘goats eat cans’ is *endorsed* varies from individual subject to individual subject (even subjects sharing the same actual world), in accord with whether their mental state is apt to endorse it. For truth-conditionalism, the meaning-giving condition for ‘goats eat cans’ targets a single entity, common to all (actual-world) subjects, and is satisfied or not regardless of how anyone is mentally; for endorsement-conditionalism, that condition targets a distinct entity for each subject at each time, and is satisfied or not exactly as a matter of how that subject is then mentally.

Ranked by first-glance plausibility, endorsement-conditionalism is not below truth-conditionalism, but arguably above: nebulously if perhaps plausibly, the meaning of a sentence is what it is used to mean—namely, as an archetype, *one’s occupying a mental state sufficient for its endorsement*, as displayed through its use in assertion (for a declarative-mood sentence; otherwise, in that distinct mood-appropriate archetypal speech act). Moreover, truth-conditionalism is implausibly stringent, endorsement-conditionalism credibly flexible, regarding whether every meaningful sentence must in some sense have a truth-condition: for an interrogative (‘who shot JR?’) or imperative (‘pay the rent!’) sentence, no such sense is evident; by contrast, such sentences plausibly do have endorsement-conditions—perhaps (respectively) *wondering who shot JR* and *intending (salient) so-and-so to pay the rent*. Moreover, when assignment of a truth-condition is plausible (‘goats eat cans’), so is assignment of an endorsement-condition (*holding an information-state endorsing the proposition that goats eat cans*): perhaps, when a mental state meets the endorsement-condition, that mental state itself, by virtue of the propositions endorsed in its information-state, has a truth-condition; perhaps then the sentence inherits that truth-condition ‘by courtesy’—but the move does not generalize beyond the declarative, in the absence of any evident sense in which *wondering who shot JR* or *intending so-and-so to pay the rent* imposes a truth-condition on the world.

The attitudes of *wondering* and *intending* are not alone in their failure to impose any condition on the world for their truth: joining them is *supposition* in various varieties (and under various labels: *hypothesis*; *pretense*; *purport*)—which we might analyze as a ‘subsidiary’ mental state, held (perhaps alongside any number of other suppositions) within one’s ‘root’ mental state, and potentially bearing any aspect available in a ‘root’ mental state (including ‘daughter’ suppositions of its own). Holding a supposition that goats eat cans—a supposition whose information-state represents that goats eat cans—does not thereby impose any truth-condition on the world: even if one *suppositionally* imposes the truth-condition that the world be *such that goats eat cans*, to do something suppositionally is not thereby to do it outright. So if a sentence with a *wondering-* or *intending-*based endorsement-condition lacks truth-conditions (even by courtesy), the same would be true of a sentence with a *suppositional* endorsement-condition—a condition satisfied just by those subjects holding an appropriate sort of supposition.

sumptive difficulty next in line, the elusiveness of any nonexplanatory ‘phenomenal-representational’ understanding, has so far itself eluded widespread attention (though see [Hellie 2018a](#), 6.3).

Are there any? A first-glance plausible case is the *metafictional* sentence, like ‘in ‘The adventure of the speckled band’, a Russell’s viper climbs a rope’. Perhaps endorsing it requires holding a supposition that a Russell’s viper climbs a rope, in a distinctive manner involving ‘The adventure of the speckled band’—more specifically, perhaps, by committing the supposition to hold such-and-such information whenever the text of ‘Speckled band’ asserts such-and-such. The account is intuitively plausible, and moreover does not as its first move postulate a novel ontology (crucially, for those seeking a theory of fiction unencumbered by metaphysical perplexities).

Suppositional endorsement-conditions for *mental* sentences are not far off. According to *simulationists* (Heal 2003), metapsychological reasoning makes essential use of empathy with the other. Empathizing with Fred is ‘occupying Fred’s viewpoint’: not *literally*, of course, but *suppositionally*—by holding a ‘Fred-simulation’: a supposition held in a distinctively Fred-viewpoint-occupying manner. To sketch some further details:

- Σ1. For a supposition to count as ‘occupying *a* viewpoint’, it should be constrained by ‘reasonability’; for the viewpoint to count as *Fred’s* (at a certain time), it should be constrained empirically by information about Fred (then).

Sharpening, ‘reasonability’ can be understood as *similarity to oneself* (Heal 1998); the information plausibly concerns Fred’s (wide) *sensory stimulations* and (wide) *behavioral responses* (and perhaps nothing else: Lewis 1974).

Sharpening more, we may allow that, in a given mental state, one finds some mental states easier to occupy, others harder: this can be represented with an *availability*-ordering on mental states (easier occupation goes with greater availability), with one’s own mental state uniquely maximally available; and we may require that a mental state is *Fred-apt* by certain information only if its ‘evidence of the senses’ has content entailed by the facts of Fred’s sensory stimulations (by the information) and its ‘intentions-in-action’ have content entailed by the kinds of Fred’s behavioral responses (by the information).

Assembling, one’s simulation of Fred is that mental state *most available* (to one) among those mental states which are *Fred-apt* (for one).¹⁰

- Σ2. When ‘the other’ is *oneself*, the aptness-constraint is null: one’s ‘self-simulation’ is just the mental state most available from one’s own, *simpliciter*—namely, one’s own mental state. (So one simulates oneself as Ψ -ing just if one Ψ s, and as not Ψ -ing just if one does not Ψ : akin to ‘Moore-paradoxicality’.)
- Σ3. Empathy is sometimes at a *total loss*: facing the prospect of occupying the point of view of this table, I find that I cannot: by my information, *no* available mental state is ‘this table-apt’.¹¹
- Σ4. Empathy is other times at a *partial loss*. Consider (prerelease) Black-and-White Mary: some things about what it will be like for her upon first seeing a red thing, she knows (that she will then recognize herself to see a color previously unseen and unimaginable; that she will then feel excited at this); others, she famously does not know, and cannot get to know by reckoning (that—as I would put it—she will then recognize herself to see red qua *this color*).

¹⁰The format is structurally akin to the Stalnaker conditional (Stalnaker 1968), where ‘if ψ ’ shifts a world to its most similar ψ -world.

¹¹Moreover—contrasting with (Σ5c)—this unavailability is ‘robust’, persisting as my information is weakened.

Mary's ignorance can be traced to an imperfect 'resolution'¹² with which she surveys the space of mental states: she discriminates states involving recognizing oneself to see a color previously unseen from states not involving this; but she does not discriminate states involving recognizing oneself to see *red* qua *this color* from those involving recognizing oneself to see *green* (or *blue*, and so forth) qua *this color*. Failing to discriminate these latter, she cannot even entertain them individually in thought for sake of supposition, let alone simulate someone (including her future self) as occupying a specific one of them.

To generalize, we adjust the definition of *one's simulation of Fred*: it is that *discriminable region of mental state-space* most available (to one) among those *discriminable regions of mental state-space* which are Fred-apt (for one); Fred as one simulates him is just those ways common to all states in the discriminated region.

- Σ5. Other complications handle uncertainty from other sources: (a) *partial information* (several *x*-apt states or discriminable regions are tied for most available); (b) *weak empathy* (*aptness* is not a function but a relation); (c) *imperfect intelligibility* (a state/region is *imperfectly x-apt* just if apt to some weakening of one's information about *x*: then *x* is *imperfectly intelligible* when no *x*-apt states/regions are available, but several imperfectly *x*-apt states/regions are: compare Lewis 1982)—across the board, the way Fred is simulated to be is what is common to the several simulations.
- Σ6. Mental–physical explanations are distinctive in that they involve a trip through supposition (compare Hellie 2018b). Consider an example dialogue:

A: Why did Fred arrive at noon [physical]? B: Because several days ago he resolved to set an alarm to get him there by then [mental]. A: But granting that, why? B(1): Because Fred resolved to set an alarm, he did [physical]. A: But granting that, why? B(2): Because Fred set the alarm, it went off [physical]. A: But granting that, why? B(3): Because the alarm went off, Fred noticed it [mental]. A: But granting that, why? B(4): Because Fred noticed the alarm, he set about acting to arrive at noon [mental]. A: But granting that, why? B(5): Because Fred set about acting to arrive at noon, he did [physical].

Explanation (1) is mental-to-physical: supposing oneself (qua Fred several days ago) to resolve to set an alarm, the supposition is more reasonable (more 'available') if it includes evidence of the senses and intentional actions characteristic of setting an alarm; but then the *aptness* constraint requires information about Fred's sensory stimulation and behavioral responses to the effect that the alarm is set. Explanation (2) is physical-to-physical, and evolves the information that the alarm has been set in conformity to expectations, yielding the information that the alarm went off. Explanation (3) is physical-to-mental: with the information that the alarm went off near Fred some time before noon and was therefore among his sensory stimulations then, the 'aptness' constraint (under the expectation that Fred notices the alarm) requires a supposition for Fred then with evidence that the alarm has gone off. Explanation (4) is mental-to-mental: carrying forward the intention with which the alarm was set from the Fred-several-days-ago supposition to the Fred-before-noon supposition, that latter supposition is then more available if it sets about acting to arrive at noon. Explanation (5) is mental-to-physical, returning to the pattern of explanation (1).

¹²For links between coarse discrimination and nonspecific content, compare Williamson 1990, 2.2 and Hellie 2005, 1.1; for the link to conceptualization and questions, and the 'resolution' terminology, see Yalcin 2011 and Pérez Carballo 2016.

Explanation (2), the physical-to-physical portion, goes on just inside of the information-state, and involves no detour through the supposition: this, perhaps, is what is characteristic of ‘causal’ explanation. Explanation (4), the mental-to-mental portion, goes on just inside of the supposition, and involves no passage through the information-state: this, perhaps, is what is characteristic of ‘rationalizing’ explanation. But explanations (1) and (3) pass (respectively) from the supposition to the information-state and from the information-state to the supposition: this makes them neither (purely) ‘causal’ nor (purely) ‘rationalizing’. Instead, they involve an essential *shift of view*, between the ‘objective’ viewpoint of causality and the ‘subjective’ viewpoint of rationality: the requirement of *aptness* constrains this shift of view, binding information about sensation and behavior to supposition about evidence and intentional action.

Armed with this conception of simulations (or perhaps some alternative), an endorsement-conditionalist could supply suppositional endorsement-conditions along the following lines: ‘Fred intends to pay the rent’ is endorsed by just those holding simulations of Fred as intending to pay the rent.

One might anticipate the sort of payoff that comes from moving burdens off of the world and on to the mind—rightly so, as will be discussed. But one might also fear that it is too good to be true: the approach is broadly ‘expressivist’—and haven’t all such attempts been shot down by the ‘Frege-Geach problem’, of handling ‘embedded’ occurrences (Geach 1960; Schroeder 2008)? Were we to impose a restriction to early-Davidson resources (deriving ‘E-sentences’ from axiom schemata using weak rules), *extreme skepticism* would be warranted: we might want the E-sentence ‘*Brent believes that Rance does not intends to pay the rent*’ is endorsed in *c* just if *c* simulates Brent as simulating Rance as not intending to pay the rent—but how on earth to get it?

Still, goods are for goose and gander alike. The challenges of *now* and *actually* are, in effect, a Frege-Geach problem for truth-conditionalism: resolving it requires the added articulation of the Standard Framework. Adapting the Standard Framework for endorsement-conditionalism requires only a minor tweak, of replacing (S3T) with (S3E):

S3E. Logical consequence is *endorsement-preservation* (compare Humberstone 1981, Yalcin 2007, Hellie 2016), analyzed by relating contexts and propositions to *information-states*:

- (a) Contexts are interpreted as mental states; a context *c* determines at least a propositional information-state b_c (and also a time t_c and agent a_c : I would argue, if the mental state is that of subject *a* at time *t*, then $a = a_c$ and $t = t_c$);
- (b) Propositions are analyzed as (determining) *endorsement-conditions* on *information-states*—more to follow shortly;

The sentence φ is then *endorsed in a context c* just if the proposition $\varphi(c)$ is endorsed in the contextual information-state b_c —so that premisses Ψ entail a conclusion φ just if for every context *c*: if (for every $\psi \in \Psi$, $\psi(c)$ is endorsed in b_c), then $\varphi(c)$ is endorsed in b_c .

This framework allows for drawing the needed distinction, between sentences with a broadly ‘descriptive’ meaning, involving an *informational* endorsement-condition, and sentences with instead a broadly ‘expressive’ meaning—including those with *suppositional* endorsement-conditions.

To help with this, we will sketch an endorsement-conditionalist interpretation of *propositions*. For truth-conditionalists, a proposition is (or determines) a truth-condition on possible worlds; do endorsement-conditionalists say a proposition is (or determines) an endorsement-condition on

information-states? Sort of—but because information-states are propositions, this does not illuminate what either are like.

Fortunately, propositions are nailed down in (T2) by their role as *increments of information*. An increment of information, perhaps, essentially *answers questions*—under a modestly technical notion of ‘question’ (compare Hamblin 1963, Lewis 1988a, Groenendijk and Stokhof 1996):

Let a *polar* (yes/no) question be *objective* just if (i) both answers present intelligible ways for things to be (excluding, say, *is $2 + 2 = 5$?*: the *yes* answer is not intelligible), and (ii) each answer ‘appears the same’ from every vantage point (excluding, say, *is that a goat?*: the *yes* answer goes with *that is a goat*, which changes its appearance with what is being demonstrated).

For a pair of objective polar questions, there are four combinations of ‘yes’ and ‘no’ answers; some of these four (at least two) are intelligible ways for things to be: these are the ‘total answers’ to that unique question which is the *product* of that pair of questions—mutatis mutandis, for any (perhaps any *finite*) such set.

Last, a (‘technical’) *question* is the product of some set (perhaps some *finite* set) of objective polar questions; for a given question, its *answers* are the non-empty sets of its total answers; and an *answer* is an answer to some question or other.

Identifying increments of information with answers and propositions with increments of information, propositions are identified with answers: *trivial* and *absurd* propositions are limiting cases, identified with maximally weak and maximally strong increments of information; other propositions are *informative*.

Perhaps there is a set of all questions; and perhaps the product over this set is itself a question: if so, this latter is the *total question*, and its total answers are the *tototal answers*. Tototal answers and possible worlds appear quite similar: perhaps theory need not discriminate them. If so, then propositions qua answers qua sets of tototal answers on the one hand, and propositions qua sets of possible worlds on the other, are indiscriminable. So: the possible-worlds theory and the answer theory of propositions are indiscriminable, if there is a total question (for friends of the answer theory, this shows that the determination of a possible-worlds truth-condition is inessential to propositions, but at best a lucky accident). We embrace the total question to simplify explication of the sense in which a proposition p determines an endorsement-condition on (propositions qua) information-states: p determines a set S of tototal answers; any (proposition qua) information-state determines some set T of tototal answers, and endorses p just if T is a subset of S (namely, just if every tototal answer taken seriously in the information-state is compatible with p ; just if the information state has ruled out any way of siding with not- p).

We can now distinguish ‘descriptive’ from ‘expressive’ sentences. When φ is *descriptive*, the proposition $\varphi(c)$ is (typically or always) informative, and the ‘function’ of φ is for its assertion in a context c is to convey that informative proposition $\varphi(c)$. An *expressive* sentence, by contrast, has a different ‘function’: one never asserts it to convey an informative proposition, but rather to display that one’s mental state meets its endorsement-condition. Suppose, for example, that φ has a suppositional endorsement-condition—that endorsing φ requires nothing of a context/mental state c beyond c ’s holding such-and-such a supposition; the specific information carried in the information-state b_c is irrelevant. This requires that $\varphi(c)$ is such as to be endorsed (whatever the information-state of c) whenever c holds such-and-such supposition, and that $\varphi(c)$ is such as to not be endorsed (whatever the information-state of c) whenever c fails to hold such-and-such supposition. These in turn are implemented by setting the value of $\varphi(c)$ to the trivial proposition (endorsed whatever b_c may be), just if c holds the φ -appropriate supposition; and otherwise to the absurd proposition (rejected unless b_c is itself absurd)—a sort of pattern sometimes known

as *testing the context* (compare Veltman 1996, Gillies 2004); in the present case, testing it for such-and-such supposition.

Detailed issues of how to combine this ‘test of context’ behavior with various embedding phenomena are beyond the scope of this discussion; as a ‘proof of concept’, however, the attached footnote briefly sketches a simulationism-friendly compositional semantic value for sentences ascribing beliefs.¹³

4 Semantic gaps within endorsement-conditionalism

Endorsement-conditionalism offers a fresh look at the semantic gap phenomena. Where these arise (as we have seen), they lead, via (I), (II), and (S3T) to the *contextual truth-value underdetermination* of the involved mental truths by any physical truth, and thence to the *dispiriting consequences*. But (S3T) is a specifically truth-conditionalist commitment, replaced by the endorsement-conditionalist with (S3E).

This concluding section *first* explains (swiftly) that semantic gap phenomena, (I), (II), and (S3E) do not lead to *contextual truth-value underdetermination*—nor therefore to the *dispiriting consequences*; and *second* sketches (more gradually) an endorsement-conditionalist analysis of the various semantic gap phenomena (highlights: the overwhelmingly plausible *epistemic gap* is legitimated; while truth-conditionalism assimilates to it the much more contentious *suppositional gap*, this assimilation is an artifact of the ‘bivalence’ of *truth*: by contrast, with the ‘trivalence’ of *endorsement*, the two gaps can be segregated, and due allowance given to their contrasting plausibility; finally, the *explanatory gap* is yet a third effect, emanating from the ‘viewpoint shift’ between physical and mental reasoning).

First: consider a worst case scenario: for *every* (consistent) mental sentence ψ , it is implicated in one or other sort of semantic gap with *every* (consistent) physical sentence φ : by (II), for any such φ and ψ , endorsing φ does not require endorsing either ψ or $\neg\psi$; by (I), for any such φ and ψ , φ entails neither ψ nor $\neg\psi$. But by (S3E), this just reiterates the endorsement-gap (if more formally): for any mental ψ and physical φ , there are contexts c' and c'' such that the information-state $b_{c'}$ endorses the proposition $\varphi(c')$ but not the proposition $\psi(c')$, while the information-state $b_{c''}$ endorses the proposition $\varphi(c'')$ but not the proposition $\neg\psi(c'')$.

The previous section sketches an analysis of mental sentences as *tests of context*: for any context/mental state c and mental sentence ψ , the proposition $\psi(c)$ is either *trivial* or *absurd*, just as whether c holds a ψ -appropriate simulation. So if the information-state $b_{c'}$ fails to endorse the proposition $\psi(c')$, $\psi(c')$ is absurd, and c' *does not* hold a ψ -appropriate simulation; and if the information-state $b_{c''}$ fails to endorse the proposition $\neg\psi(c'')$, $\neg\psi(c'')$ is absurd, $\psi(c'')$ is trivial, and c'' *does* hold a ψ -appropriate simulation. We may, moreover, pick any physical sentence φ we like: to maximize the challenge, let φ be context-insensitive and total—there is some maximally-specific proposition p such that for any context c , $p = \varphi(c)$. Then because both $b_{c'}$ and $b_{c''}$ endorse this proposition p , endorsement of this proposition is compatible both with holding the ψ -appropriate simulation and with failing to do so—for any increment of physical information and any simulation, holding the former neither requires nor prohibits holding the latter.

¹³Double verticals are semantic-value brackets (with $\|\varphi\|$ mapping a mental state, various indices, and a context to a proposition); for mental state m , $\Sigma_\tau(m)$ is the $\|\tau\|$ -apt mental state most available from m ; $m \Vdash p := m$'s information-state endorses p ; and \top and \perp the *trivial* and *absurd* propositions. Then: $\|\mathbb{B}^\tau\varphi\|(m, x, c) = \top$, or \perp , just as whether $\Sigma_\tau(m) \Vdash \|\varphi\|(\Sigma_\tau(m), x, c)$. Last (where m_c and x_c are the mental state and indices determined by context c), $\varphi(c) = \|\varphi\|(m_c, x_c, c)$.

Still, the dispiriting consequences are neutralized:

- When c' , but not c'' , refrains from ψ -appropriate simulation, the dispute does not involve conflicting information, and is indeed compatible with *identifying* their information-states: whatever either thinks God did in making the world, the other agrees—their dispute is over the unrelated question of how each should react empathetically to this or that agreed-upon aspect of reality: a conflict of ‘sentiment’, rather than over anything ‘objective’.

Further dispute over *physicalist metaphysics* may well yet be pursued, but its forum will have to be outside of the philosophy of mind.

- We may grant that the physical is causally closed, and that one’s physical information ‘freely crosscuts’ which simulations one holds, without withdrawing the legitimacy of appeals to mental–physical interaction. The discussion under ($\Sigma 6$) illustrates how such appeals involve a mix of causal- and noncausal-explanatory reasoning. While free-crosscut would make for potentially irresolvable dispute over any particular candidate noncausal explanans, it would also license one to ignore such dispute and forge ahead with such appeals as are appropriate to one’s sentiments.

The threat of *epiphenomenalism* is neutralized, by rising to the challenge from [Davidson 1963](#), and offering an account of noncausal explanation.

- With epiphenomenalism out of the way, there is no longer any need to search around for a semantic gap *internal* to mental language: *separatism*, and the quest for ‘phenomenality’ it requires, is no longer useful in theory.

Second (now less urgently, having disarmed the *dispiriting consequences*): what to make of the semantic gap phenomena—which are genuine, to what extent, and in what do they consist?

Start with the *epistemic gap*: the epistemic gap judgment regarding Black-and-White Mary (and in related cases, such as bats, or the smell of skunks or taste of Vegemite) is overwhelmingly plausible: we should use the apparatus to analyze it.

Suppose that (prerelease) Mary has total physical knowledge about her future self upon first seeing a red thing (total physical knowledge *simpliciter*, if needed): this is captured in some true physical sentence φ . Let ψ be a truth along the lines of ‘post-release Mary Ψ s’, where Ψ is a mental predicate discriminating more finely than Mary’s resolution of the space of mental states—perhaps Ψ is *have as evidence that one foveates a red thing*; if not, the reader may coin a predicate to their liking. Plausibly, Mary does not know ψ : after all, as discussed under ($\Sigma 4$), for some predicate Ψ' (perhaps, *have as evidence that one foveates a green thing*) conflicting with Ψ but undiscriminated from Ψ by Mary’s resolution of ‘mental space’, Mary is not in position to wonder whether she will Ψ or will rather Ψ' , and therefore not in position to endorse either. So with Mary knowing and endorsing φ but neither knowing nor endorsing ψ , φ does not entail ψ .

This failure of entailment does not, however, predict the consistency of φ with $\neg\psi$. Endorsement is *trivalent*: when premisses do not entail a conclusion, one way for this is for some context to endorse the premisses and also the negation of the conclusion; but another way is for some context to endorse the premisses but neither the conclusion nor its negation. (This contrasts with truth, which is *bivalent*: the only way for premisses not to entail a conclusion is for there to be a context verifying the premisses but falsifying the conclusion.) The stronger condition would require a subject who knows φ but who also endorses $\neg\psi$. But this sort of subject *disagrees* with our view of what it will be like for post-release Mary: this is very different from *failure to endorse*

our view—and it is only the latter which is legitimated by the many widely-discussed examples of *failure to know what it is like*.¹⁴

Now to the *suppositional gap*. It is striking that the *epistemic* gap is scarcely controversial (and the Nemirow-Lewis ‘ability hypothesis’ (Nemirow 1980, Lewis 1988b) that Black-and-White Mary undergoes no ‘rational-psychological’ change widely derided), while the *suppositional* gap is significantly more so. We would like to explain the asymmetry, not just to settle whether ‘zombies’, or ‘inverts’, are ‘conceivable’.

Observe at the outset that supposing φ and Fred Ψ s involves ‘nesting’ suppositions: the ‘outer’ supposition is populated *both* with an information-state endorsing φ , and with an ‘inner’ supposition, which is a simulation of Fred as Ψ -ing. Presumably a nested simulation is still a simulation, and therefore still is constrained ($\Sigma 1$) to maximize availability subject to Fred-aptness: but the information-state to which *aptness* is pegged is not one’s ‘root’ information, but that of the ‘outer’ supposition; whereas *availability* is pegged instead to the ‘root’ mental state, rather than the ‘outer’ supposition (otherwise, the standards of the ‘outer’ supposition for what constitutes reasonability would be involved: this would seem to be appropriate to, say, ‘first-person fiction’ about someone with information φ who thinks Fred Ψ s; but what is wanted instead is just *my* supposition both that φ and that Fred Ψ s).

So suppose we think Fred, a normal subject under normal conditions, foveates a red tomato: in consequence, we simulate Fred with a mental state such that what it is like to be in it is as if foveating a red tomato (here and henceforth leaving tacit ‘ordinariness’)—in particular, this is *not* a mental state such that what it is like to be in it is as if foveating a *green* tomato. And let us introduce a supposition in which things are physically exactly as they actually are. This, presumably, is exactly recapitulating my ‘root’ physical information in the suppositional information—and, if need be, amplifying it to complete physical information in a way that excludes any surprises (for instance, some hitherto unnoticed visual abnormality in Fred). Assume, to simplify, that all information is physical information:¹⁵ then the suppositional information is *exactly* my root information.

But this starkly constrains the suppositional simulation of Fred. Because my ‘root’ and ‘outer-supposition’ information-states are the same, a mental state is ‘suppositionally Fred-apt’ (Fred-apt by the lights of the ‘outer supposition’ information-state) just if ‘root Fred-apt’ (Fred-apt by the lights of the ‘root’ information-state). And, recall, ‘suppositional availability’ is just ‘root availability’. So the *suppositional* simulation of Fred is the most root-available of the suppositionally-Fred-apt mental states—namely, the most root-available of the *root*-Fred-apt mental states: so my *suppositional* and *root* simulations of Fred do not differ—so, in particular, the suppositional simulation is also a state such that what it is like to be in it is *not* as if foveating a green tomato.

But enriching the supposition so that Fred is inverted requires the suppositional simulation to be a mental state such that what it is like to be in it *is* as if foveating a green tomato. Unfortunately, this is incompatible with the supposition of physical identity. And so it cannot be coherently supposed that Fred is an ‘invert’ (similarly, because the suppositional simulation is such that what it is like to be in it *is* as if foveating a red tomato, there *is* a suppositional simulation—incompatibly with

¹⁴Compare Nagel 1974, 442n8: ‘My point[] is not that we cannot *know* what it is like to be a bat. I am not raising that epistemological problem. My point is rather that even to form a *conception* of what it is like to be a bat [] one must take up the bat’s point of view’. Nagel himself therefore advances a ‘no concept’ treatment of ignorance of what it is like: compare Harman 1990, Hellie 2004; contrast Chalmers 2004a, 284: treating objections there, see just below on ‘appeal to the conceivability of zombies’; ($\Sigma 5b$) on ‘*other* organisms (bats or Martians[])’ and perhaps ‘phenomenal indistinguishability’; and ($\Sigma 2$) on ‘introspection yields aposteriori knowledge’.

¹⁵See Lewis 1988b, 281 for why the assumption is innocent.

the supposition that Fred is a zombie); and so the request to suppose it is *unintelligible*.

Unintelligible to me, anyway. But *perhaps* someone else can conceive of inverts or zombies—*can*, intelligibly; intelligibly to *me*: perhaps *I* can make sense of someone’s holding an invert or zombie supposition. Can I? Anyone who does, as argued, already thinks Fred is an invert or zombie; so the issue is whether I can make sense of someone—Zeb—who thinks this. Zeb shares my information, so the same mental states are Fred-apt for me as for Zeb; but among those, the most available for Zeb is either different (invert) or absent (zombie): an availability-structure very different from mine. If Zeb is intelligible, some Zeb-apt mental state is available from mine; if Zeb thinks Fred is an invert or zombie, that mental state has a very different availability-structure to mine. Whether this prospect is genuine is, at present, an open question.

The literature contains many confident proclamations that zombies/inverts do not exist, but are yet conceivable. As argued, these attitudes are incompatible, rendering those who so proclaim imperfectly intelligible: what they articulate cannot be had in mind, so what they have in mind has not been adequately articulated. How then, perhaps, to articulate what they really do have in mind? Several (jointly compatible) options come to mind:

- (i) They imagine a system of pictures: circles, linked by arrows, some decorated with colors; clearly the nature of the pictorial system permits interchanging colors, or erasing them, leaving circles and arrows the same. The system of pictures is used as a calculus for reasoning about mental–physical relationships, presuming the separatist metapsychology: systems of circles and arrows inherit the meaning of ‘functional’ concepts; colors, of ‘phenomenal’ concepts. The permission from the nature of the pictorial system is treated as a permission within the calculus: the permission to interchange colors as a permission to conceive of inverts; to erase them, of zombies. The cost of revisiting separatism, or the adequacy of the pictorial system as a calculus even granting separatism, is high, the benefits unclear; the costs of its continued use are unclear, the benefits significant and known: efficiency favors continuing with ‘normal science’.
- (ii) They affirm the predictions of well-attested theory. After all, there is an evidently genuine *epistemic gap* between a certain mental ψ^\dagger and any physical φ ; by (II) and (I), this yields the nonentailment by any φ of ψ^\dagger . By (S3T), this nonentailment requires some context verifying (for any φ) $\neg\psi^\dagger \wedge \varphi$; but by (S3T) again, this predicts the ‘non-antivalidity’ of (for any φ) $\neg\psi^\dagger \wedge \varphi$. This finally, by (I) and (II-C), yields the supposability of (for any φ) $\neg\psi^\dagger \wedge \varphi$ —the conceivability of zombies or inverts.
- (iii) They implicitly recognize the incoherence of their view, but cannot articulate its source. On the present account, the incoherence stems from intelligibility constraints on suppositional ‘children’ by ‘parent’ mental states. Our philosophical tradition has so far prioritized ‘intra-level’ coherence constraints (synchronically, on information-states; diachronically, among prior and posterior information-states and accumulated evidence; synchronically, between credence, value, and decision); for that matter, even taking note of the relevance of supposition requires ‘simulationism’, itself a minority doctrine. In consequence, the conceptual/descriptive resources required to characterize the incoherence are lacking; with innocence presumed and the nature of guilt unarticulated, one reasonably sides with conceivability.

Last to the *explanatory gap*. Like the epistemic gap, the supporting judgments (Leibniz’s mill, for example) are highly plausible: we should again use the apparatus to analyze it.

To do so, it will be useful to map connections among several closely related phenomena:

- (i) φ (constitutively) explains ψ
- (ii) Granting φ forecloses wondering why ψ
- (iii) Granting φ forecloses not accepting ψ
- (iv) Granting φ forecloses rejecting ψ

It is hard to discern (i) from (ii): let them be equivalent. Trivalence blocks the way from (iii) to (iv) (avoiding the *dispiriting consequences*). Having stipulated equivalence of (i) and (ii), are these required by (iii)?

Perhaps not. Consider the *aptness* constraint on simulation. Bracketing the various sources of uncertainty under ($\Sigma 4$) and ($\Sigma 5$), let us assume a (perhaps for still other reasons, implausibly demanding) aptness constraint on which, with information that Fred's sensory stimulation is F , one must simulate Fred as having evidence that his sensory stimulation is F . By this constraint, granting that Fred's sensory stimulation is F *does* foreclose leaving open whether Fred has evidence that his sensory stimulation is F .

Now, presumably we should deny every instance of (i) and of (ii), for physical φ and mental ψ —how could an 'objective' fact constitute a 'projection of sentiment'? One such instance to be denied is: granting that Fred's sensory stimulation is F *forecloses wondering why* Fred has evidence that his sensory stimulation is F . But we just accepted the corresponding instance of (iii)—so there is more to φ *explaining* ψ than φ *foreclosing not accepting* ψ (on the affirmative side).

The difference, it would seem, is that φ foreclosing not accepting ψ makes for *explanation* only when φ and ψ are appreciated from the same perspective: in the case of physical–physical constitution (water and H₂O), this is from the 'objective' perspective; if there is mental–mental constitutive explanation (perhaps *belief that Fred sees red* is constituted by information and availability), this is from the 'subjective' perspective. By contrast, foreclosure by the aptness constraint essentially involves a viewpoint-shift between the objective and subjective view, and therefore does not rise to the level of explanation. In particular, without accommodating this, pursuit of the 'hard problem of consciousness' (Chalmers 1995) will continue to be fruitless.

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