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THE LOGICAL CONTINGENCY OF IDENTITY

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ABSTRACT

I show that intuitive and logical considerations do not justify introducing Leibniz's Law of the Indiscernibility of Identicals in more than a limited form, as applying to atomic formulas. Once this is accepted, it follows that Leibniz's Law generalises to all formulas of the first-order Predicate Calculus but not to modal formulas. Among other things, identity turns out to be logically contingent.

Keywords: *Leibniz's Law, indiscernibility of identicals, identity, necessity, contingency*

There is a straightforward formal proof of the necessity of identity, going back at least to Quine (1953, 156). It relies on the two derivation rules, necessitation (NEC) and Leibniz's Law of the Indiscernibility of Identicals (LL). NEC enables us to derive □A ('necessarily A') from any theorem A. Leibniz's Law allows us to substitute identicals in any formula:

Leibniz's Law: $a = b$, A(a) ⊢ A(b/a)

A(b/a) is the result of substituting none, some or all occurrences of 'a' in 'A' by 'b'. One formulation and derivation of the necessity of identity runs as follows:

1	(1)	$a = b$	Premise
	(2)	$a = a$	Axiom (Law of Identity)
	(3)	$\Box(a = a)$	NEC 2
1	(4)	$\Box(a = b)$	LL 1, 3
	(5)	$(a = b) \rightarrow \Box(a = b)$	Implication Introduction 1, 4

The line number is in parentheses; numbers to its left designate the line numbers of the premises, if any, on which the formula in that line depends. As can be seen, the formula in line (5) depends on no premise and is thus a theorem. It says that if *a* is identical to *b*, then *a* is necessarily identical to *b*.

Although there is a long tradition of considering this result problematic (see survey and references in (Burgess 2014)), there is currently no generally accepted way of showing the formal considerations uncompelling. In this paper, I try to provide reasons for holding them such.[1]

My basic claim is that Leibniz's Law has been overgeneralised. Suppose *a* is *b*, and suppose *a* has a certain property; then *b*, namely *a*, has it. Also, if *a* stands in any relation, then *b*, namely *a*, stands in that relation. These intuitive claims justify Leibniz's Law as applying to *properties and relations*. To formalise it in logic, we should allow the substitution of identicals in formulas that express what we intuitively count as properties and relations, namely, one- and many-place predicates. For instance, if $a = b$ and $P(a)$, then $P(b)$; or, if $a = b$ and $R(a, c)$, then $R(b, c)$. More generally, for any n-place predicate P^n, from $a = b$ and $P^n(\ldots a\ldots)$ we can infer $P^n(\ldots b/a\ldots)$:

$$a = b,\ P^n(\ldots a\ldots) \vdash P^n(\ldots b/a\ldots)$$

However, this intuitive justification of Leibniz's Law does not support formalising it as allowing the substitution of identicals in more complex formulas, non-atomic ones, which do not just express properties or relations. It is not that such substitution is *prohibited* by the intuitive justification, but if it is to be allowed then it should be justified by *deriving* it from the intuitive version or its formalisation.

This cautionary note is further supported by the fact that, with some sentences of more complex kinds, the applicability of Leibniz's Law is far from certain. Although Mr Utterson knows he's an old friend of Dr Henry Jekyll, does he also know he's an old friend of Mr Edward Hyde? Even if he does, this should be *shown*. Namely, we cannot assume that Leibniz's Law applies to all sentences but we need to derive its applicability from its limited, basic form, applied only to atomic sentences.

[1] A referee for this journal drew my attention to (Garson 2013: §12.3), where similar ideas to some of those developed below are to be found. Garson, however, justifies his views by claiming that substitutivity does not generally hold in modal contexts, while I attempt to derive this.

In fact, introducing Leibniz's Law into logic in its limited form does entail its application to all formulas of the standard version of the Predicate Calculus. I shall show this by providing an outline of an inductive proof of this claim. (In order not to make this paper too technical, some of the results are only stated; in all these cases establishing them shouldn't be difficult for anyone familiar with the relevant systems.) The proof is by induction on formula complexity (see Mendelson 1996, 96). Let us assume our calculus contains only three logical constants: ¬, ∧ and ∀.

First, LL applies, by definition, to all atomic formulas.

Assume LL applies to any formulas A(a) and B(a), and let us show that it applies to A(a) ∧ B(a). That is, we have to show that if $a = b$ and A(a) ∧ B(a), then (A(a) ∧ B(a))(b/a), namely A(b/a) ∧ B(b/a). The proof proceeds as follows:

1	(1)	A(a) ∧ B(a)	Premise
2	(2)	$a = b$	Premise
1	(3)	A(a)	Conjunction Elimination 1
1	(4)	B(a)	Conjunction Elimination 1
1, 2	(5)	A(b/a)	LL was assumed to apply to A(a)
1, 2	(6)	B(b/a)	LL was assumed to apply to B(a)
1, 2	(7)	A(b/a) ∧ B(b/a)	Conjunction Introduction 5, 6

I skip the proof for ¬. We now prove the theorem for ∀xA(x, a), assuming that LL applies to all formulas A(c/x, a), in which a constant c replaced all occurrences of x in A(x, a). We have to show that if $a = b$ and ∀xA(x, a), then ∀xA(x, b/a).

1	(1)	∀xA(x, a)	Premise
2	(2)	$a = b$	Premise
1	(3)	A(c/x, a)	Universal Elimination 1 ('c' shouldn't occur in (1) or (2))
1, 2	(4)	A(c/x, b/a)	LL was assumed to apply to A(c/x, a)
1, 2	(5)	∀xA(x, b/a)	Universal Introduction 4

Accordingly, introducing Leibniz's Law in its limited form, in which it applies only to atomic formulas, suffices for its applicability to all formulas of the standard version of the Predicate Calculus.

Since what can be proved should not be given the status of a principle, the proof system does not justify introducing Leibniz's Law in more than its limited form.

Semantic considerations also show that if Leibniz's Law is introduced as a principle in its limited form then it generalises to all formulas of the standard version of the Predicate Calculus. Namely, if the semantics respects Leibniz's Law in its limited form, as well as the standard truth-value rules for connectives and quantifiers, the applicability in the semantics of Leibniz's Law to all formulas of the standard version of the Predicate Calculus follows. In the semantics, Leibniz's Law in its limited form means that if V is a function that specifies the truth-values of formulas in a model, and $V[a = b] = T$, then for every n-place predicate P^n, $V[P^n(\ldots a \ldots)] = V[P^n(\ldots b/a \ldots)]$.

The proof of this claim is again by induction on formula complexity. Here I shall show it only for the case of negation. Namely, we assume that $V[a = b] = T$ and that $V[A(a)] = V[A(b/a)]$, and show that $V[\neg A(a)] = V[\neg A(b/a)]$. Since we assume that the semantics respects the truth-value rules for connectives, for any formula φ, $V[\neg\varphi] = T$ if $V[\varphi] = F$ and $V[\neg\varphi] = F$ if $V[\varphi] = T$. Accordingly, $V[\neg A(b/a)] = T$ (F) just in case $V[A(b/a)] = F$ (T), which holds, according to our assumption, if and only if $V[A(a)] = F$ (T), but then $V[\neg A(a)] = T$ (F), which is what we had to prove.

Again, since it is unjustified to introduce a rule as a principle if it follows from another, less general principle, the semantics also does not justify conferring the status of a principle on Leibniz's Law in its general form.

We see that both intuitively and formally, and the latter for both provability and semantic considerations, it is unjustified to introduce Leibniz's Law in more than its limited form, namely as applying only to atomic formulas.

This revision of Leibniz's Law has significant consequences when we move to modal logic. Given the standard laws of inference, substitutivity in modal contexts cannot be proved, even for a system as strong as S5. Namely, generally

$$a = b, \Box A(a) \nvdash \Box A(b/a)$$

(I do not provide here a proof of this improvability; it can be proved from the soundness of the modal systems.) This renders invalid the move from line (3) to line (4) in the proof that opened this paper, namely from $\Box(a = a)$ to $\Box(a = b)$. No other proof of the conclusion can be provided.

The case is similar with the semantics of modal logic. Namely, we can adopt as a semantic principle Leibniz's Law in its limited form without identity being necessary. For instance, in possible-worlds semantics, if '*a*' and '*b*' designate one object α at world w_1 but two different objects, α and β, at world w_2 which is accessible from w_1, then although '$a = b$' is true at w_1, '$\Box(a = b)$' is false at it (because '$a = b$' is false at w_2); at the same time, if '$P^n(\ldots a\ldots)$' is true at w_1, then so is '$P^n(\ldots b/a\ldots)$'. We thus have, with '$a = a$' as '$A(a)$' and '$a = b$' as '$A(b/a)$':

$$a = b,\ P^n(\ldots a\ldots) \vDash P^n(\ldots b/a\ldots)$$

$$a = b,\ \Box A(a) \nvDash \Box A(b/a)$$

It can be shown that if we limit Leibniz's Law in the ways described above to atomic formulas in both the proof systems and the semantics of the common formal systems, these systems remain sound and complete.[2] Limiting Leibniz's Law in this way therefore does not have any undesirable metalogical consequences.

Of course, one *can* force a semantics that makes identity necessary, which is the semantics that has standardly been used. Namely, one can stipulate that if '*a*' and '*b*' designate α at world w_1 then both designate α at any world accessible from w_1. The point is that *formal* considerations do not justify such a stipulation.

The necessity of distinctness, proved by using the necessity of identity (see, for instance, (Burgess 2011, 319)), is also invalid once we limit Leibniz's Law to n-place predicates.

To conclude, if we adopt as a logical principle the form of Leibniz's Law which I find more intuitive and logically justified, namely, the form applicable only to properties and relations, the necessity of identity does not follow from formal considerations, and this without having any undesirable formal consequences. One might try to provide other reasons for this alleged necessity, as metaphysicians have tried to do (whether successfully or not is not the subject of this paper). If successful, necessary identity can then be *represented* in our logic systems. Yet from a logical point of view, identity is better left contingent.[3]

[2] For some discussion of modal systems with contingent identity, see Hughes and Cresswell (1996: 330ff).

[3] Thanks to Daniel Kodaj, Ran Lanzet, Edi Pavlovic and an anonymous referee for comments on an earlier version of this paper.

REFERENCES

Burgess, J. 2011. The logic of necessity. In *The Bloomsbury Companion to Philosophical Logic*, eds. L. Horsten and R. Pettigrew, 299–323. London: Bloomsbury Academic.

Burgess, J. 2014. On a derivation of the necessity of identity. *Synthese* 191: 1567–1585.

Garson, J. W. 2013. *Modal Logic for Philosophers*. 2nd edition. Cambridge: Cambridge University Press.

Hughes, G. E. and M. J. Cresswell. 1996. *A New Introduction to Modal Logic*. London: Routledge.

Mendelson, E. 1996. *Introduction to Mathematical Logic*. 4th edition. London: Chapman & Hall.

Quine, W. v. 1953. Reference and modality. In his *From a Logical Point of View*. 2nd edition 1963, 139–159. Cambridge, MA: Harvard University Press.

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IS HOBBES REALLY AN ANTIREALIST ABOUT ACCIDENTS?

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ABSTRACT

In Metaphysical Themes, Robert Pasnau interprets Thomas Hobbes as an anti-realist about all accidents in general. In opposition to Pasnau, we argue that Hobbes is a realist about some accidents (e.g., motion and magnitude). Section one presents Pasnau's position on Hobbes; namely, that Hobbes is an unqualified anti-realist of the eliminativist sort. Section two offers reasons to reject Pasnau's interpretation. Hobbes explains that magnitude is mind-independent, and he offers an account of perception in terms of motion (understood as a mind-independent feature of body). Therefore, it seems incorrect to call Hobbes an anti-realist about all accidents. Section three considers Pasnau's hypothetical response: he might claim that for Hobbes, motion reduces to body and does not exist in its own right. Section four notes that reductionism about all accidents does not entail anti-realism about all accidents. Even granting Pasnau's anticipated response, his anti-realist reading does not follow. Contra Pasnau, Hobbes is best understood as claiming that motion and magnitude exist mind-independently.

Keywords: *Hobbes, Pasnau, antirealism about accidents, body, motion*

1. Pasnau's Position on Hobbes

Thomas Hobbes says in one place: "Whatsoever accidents or qualities our senses make us think there be in the world, they are not there, but are seemings and apparitions only" (Hobbes 1640, I. 2.10). What does this remark mean? One natural interpretation is the following: the mind-independent world contains no accidents (as distinct from substances); accidents are only 'seemings and apparitions' in our minds.

Robert Pasnau, for example, adopts this interpretation of Hobbes. Pasnau (2011, section 22.5) argues that for Hobbes, accidents are either: (a) nothing more real than bodies variously situated that move, or (b) nothing more real than our sensory experiences mistakenly projected onto bodies.

According to Pasnau, Hobbes denies any real existence to secondary qualities such as color and smell and also denies real existence even to kinetic–geometric primary qualities such as motion and size. Pasnau paints Hobbes as an unqualified anti-realist about all accidents.[1] Pasnau (2011, 649) explains,

> **Hobbes categorically rejects the notion of accidents**, and with it rejects the substance–accident distinction. According to Hobbes's ontology, there are only substances, some larger and some smaller. Nothing else has a place in his ontology: no forms, **no accidents**, no modes, and—in particular—no essences… When we use such metaphysical language to talk about bodies, we are speaking of nothing more than "the mode of conceiving a body". (De corpore 8.2; emphasis added)

Hobbes says that an accident is "the mode of conceiving a body", and that accidents "are seemings and apparitions only" (Hobbes 1640, I. 2.10), and Pasnau takes him seriously. According to Pasnau, Hobbes proposes "the thoroughgoing elimination of accidents in favor of an ontology of substances alone, conceived in various ways".[2] This "thoroughgoing elimination" amounts to moving accidents into the mind and rejecting their *mind-independent* existence. If accidents are mere conceptions of substance, then all accidents are mind-dependent.

Let's reflect further on the accident of color. Hobbes says that "the subject wherein colour and image are inherent is not the object or thing seen …

[1] For Pasnau on Hobbes as an anti-realist regarding sensible qualities, see mainly 22.5 of *Metaphysical Themes.*

[2] This reference is in Pasnau (2011, 170; but see also section 7.1).

but the sentient" (Hobbes 1640, I. 2. 4). Pasnau correctly glosses this as: "… the thing we perceive—the very image, and the very **color—is not something out in the world, but something in the mind**" (Pasnau 2011, 516; emphasis added). When I see a green object, the green I see is not really in the world external to my mind; instead, the perceived color exists only in my mind.

Pasnau's interpretation becomes controversial when he claims that Hobbes denies mind-independent existence not only for secondary qualities like color but also for primary qualities such as motion. That is, Pasnau attributes an *unqualified* anti-realist position to Hobbes (see Pasnau 2011, 516). An unqualified anti-realist denies that *any* accident has its existence independent of minds and claims that all accidents are mind-dependent. Pasnau claims that for Hobbes, what answers to my idea of a substance is somewhere in the world, but what answers to my idea of any one of its accidents is only in my mind.

According to Pasnau, Hobbes categorically rejects the mind-independent existence of everything except substance. And by substance, Hobbes means body: "What really exist, for Hobbes, are permanent bodies" (Pasnau 2011, 713), so that the only thing in Hobbes's ontology is body. As Hobbes says: "The world (. . . the universe… the whole mass of **all things** that **are**) is **corporeal**—that is to say, body… also every part of body is likewise body" (bold emphasis added).[3] For Pasnau's Hobbes, only one thing has mind-independent existence: body.[4] Or in Latin: *corpus*. Anyone who accepts only body in their ontology is called a corpuscularian. Pasnau paints Hobbes as a "thoroughgoing corpuscularian" (Pasnau 2011, 11).

If Pasnau is right, then according to Hobbes everything that appears to exist (colors, motion, et cetera) is nothing but an appearance of body, and body is the only thing that really exists externally to one's mind. Therefore, claims about colors or motion cannot be made true by the mind-independent world alone, for these claims are in part about ideas or phantasms of the mind. However, we hope to show in the next section that this interpretation of Hobbes is a mistake.

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[3] Hobbes, "Of Darkness from Vain Philosophy: errors concerning abstract essences". This is chapter XLVI of his *Leviathan*.

[4] One could be a realist about accidents, and either think that there are real accidents in the world that produce color experiences or that colors are merely features of experience; one could also be an antirealist about accidents and still think that colors are in the world as simply particles in motion (Thanks to an anonymous referee for pointing out this complexity). But Pasnau says that Hobbes is an unqualified anti-realist committed to denying mind-independent existence to both color *and motion*.

2. Objection to Pasnau's Position

In this section, we object to Pasnau's interpretation of Hobbes as unqualified anti-realist about all accidents. To be clear, we agree with Pasnau that Hobbes is some sort of anti-realist about some accidents. We disagree with Pasnau, however, when he interprets Hobbes's anti-realism as extending to all accidents without qualification. We argue that contrary to Pasnau's reading, Hobbes is a realist about extension (or magnitude) and motion/rest.

The key text for understanding Hobbes' position on accidents is *De Corpore* (Concerning Body), the first section of his *Elements of Philosophy*.[5] In *De Corpore* part II, entitled "The First Grounds of Philosophy", Hobbes defines place (space) and time. He asks his readers to imagine that everything in the world is annihilated except for one man. This person, Hobbes claims, would retain memories or ideas of sounds, colors, magnitudes, motions, and so forth. These memories,

> though they be nothing but ideas and phantasms, happening internally to him that imagineth; yet they will appear as if they were external, and not at all depending upon any power of the mind. (DC II.7.1; EW I, 92)

Hobbes goes on to define space as "the Phantasm of a Thing existing without the Mind simply; that is to say, that Phantasm, in which we consider no other Accident, but only that it appears without us", and time as "a Phantasm of . . . Motion, namely an Idea of … Body passing out of one Space into another by continual succession" (DC II.7.2; EW I, 94). For Hobbes, space and time are imaginary or mind-dependent, and yet possess the specious appearance of mind-independence. It is therefore natural to wonder whether spatio-temporal qualities (e.g., magnitude or motion) are also fundamentally mind-dependent according to Hobbes. Pasnau is not alone in supposing that they are.[6]

However, careful attention to Hobbes' subsequent discussion reveals that he is no proto-Kantian. Hobbes opens Chapter VIII, "Of Body and Accident", by asking readers to "suppose some one of those things [previously annihilated] to be placed again in the world, or created anew" (DC II.8.1; EW I, 102). Whereas in the initial stage of Hobbes' thought experiment, only the sole perceiver's mind and its ideas existed, now a mind-independent body is reintroduced. This new body will fill or be co-

[5] References to *De Corpore* are by part, chapter, and section number, followed by the volume and page number from Hobbes' *English Works* (EW).
[6] For another anti-realist interpretation, see Herbert (1987).

extended with "some part of space above mentioned", but also will "**have no dependence upon our thought**". Hobbes continues:

> And this is that which, for the extension of it, we commonly call *body*; and because it **depends not upon our thought**, we say is *a thing subsisting of itself*; as also *existing*, because **without us**; and lastly, it is called the *subject*, because it is so placed in and *subjected* to imaginary space, that it may be understood by reason, as well as perceived by sense. The definition, therefore, of *body* may be this, a *body is that which* ***having no dependance upon our thought****, is coincident or coextended with some part of space.* (DC II.8.1; EW I, 102; emphasis added)

Four times in this passage, Hobbes indicates that bodies themselves are mind-independent, despite being placed in imaginary space whenever we perceive them. While the first stage of his thought experiment contemplated a sort of idealist picture, at this new stage, Hobbes makes clear that he is a realist about bodies. But what about *accidents* of bodies like magnitude and motion? Are they mind-independent like bodies themselves, or mind-dependent like space and time?

Hobbes seems reluctant to offer a definition of "accident". He says, "what an *accident* is, cannot so easily be explained by any definition, as by examples", and cites extension, motion and rest as paradigmatic attributes (DC II.8.2; EW I, 102). He insists that to ask, "what is an accident?" is "an enquiry after that which we know already . . . For who does not always and in the same manner understand him that says any thing is extended, or moved, or not moved?" (DC II.8.2; EW I, 102-103) But because the lure of an explicit definition drives "most men" to mistakenly conceive of an accident as "*something*, namely some part of a natural thing", Hobbes corrects them with the following definition:

> To satisfy these men, as well as may be, they answer best that define an accident to be the manner by which any body is conceived; which is all one as if they should say, an accident is that faculty of any body, by which it works in us a conception of itself. (DC II.8.2; EW I, 103; emphasis added)

The first part of this definition is the mantra of Pasnau's anti-realist interpretation. And since Hobbes has just been talking extension, motion, and rest, it is plausible to suppose that he takes these primary qualities to be ways in which a body is conceived. But notice: Hobbes immediately restates his definition in order to clarify it. An attribute is "the manner by which a body is conceived" or a "way of conceiving a body" *in the sense* that **it is the cause of that conception**. An accident is a faculty of a body

by which it causes an idea of itself in an observer. This restatement is exceptionally good evidence that for Hobbes all accidents are *not* mind-dependent.

To explain why, we note that Hobbes continues the emphasis on causation in the very next lines as he comments on the definition of "accident" he has just offered:

> Which definition, though it be not an answer to the question propounded, yet it is an answer to that question which should have been propounded, namely, *whence does it happen that one part of any Body appears here, another there?* For this is well answered thus: *it happens* ***from the extension of that body***. Or, *how comes it to pass that the whole body, by succession, is seen now here, now there?* and the answer will be, *by reason of its motion*. Or lastly, *whence is it that any body possesseth the same space for sometime?* and the answer will be, *because it is not moved*. (DC II.8.2; EW I, 103; emphasis added)

A body's extension, motion and rest causally explain various features of that body's appearance. Hobbes is explicit that one of these causes—extension—is just as mind-independent as the body to which it belongs. He says:

> The *extension* of a body, is the same thing with the *magnitude* of it, or that which some call *real space*. But this *magnitude* does not depend upon our cogitation, as imaginary space doth; for this is an effect of our imagination, but *magnitude* is the cause of it; this is an accident of the mind, that of a Body existing out of the Mind. (DC II.8.4; EW I, 105; emphasis added)

In addition to the mind-dependent imaginary space, there is real space (i.e., true extension or magnitude), and only this latter mind-independent quality serves as a *cause*. Perhaps because of this passage, Pasnau admits that Hobbes takes body "to include (or perhaps consist of) magnitude and extension..." (Pasnau 2011, 32). But notice, Hobbes here says not that true extension *is* body, but that it is an accident *of* body.

While less explicit, Hobbes' language about motion in *De Corpore* also strongly suggests that it, too, is mind-independent. First, consider this list of reasons that Hobbes gives to prove the distinction between real and imaginary space:

> … *place* is nothing out of the Mind, nor *magnitude* any thing within it … *place* is feigned extension, but *magnitude* true extension; and a placed body is not extension, but

> a thing extended. Besides, *place is immovable* … (DC II.8.5; EW I, 105; emphasis added)

Notice that Hobbes here speaks metaphysically, contrasting mind-dependent and mind-independent entities ("place" and "magnitude"). He then clearly intends to contrast immovable imaginary place with movable real bodies. In this context, he seems to suggest that the motion of bodies is just as real or mind-independent as the bodies themselves.

This mind-independence of motion is reinforced by Hobbes' reduction of causal power to motion. He says:

> … the efficient cause of all motion and mutation consists in the motion of the agent, or agents; and … the power of the agent is the same thing with the efficient cause. From whence it may be understood, that all active power consists in motion also; and that power is not a certain accident which differs from all acts, but is indeed an act, namely motion, which is therefore called power, because another act shall be produced by it afterwards. (DC II.10.6; EW I, 131)

Hobbes suggests that a mind-independent accident is "*that faculty of any body, by which it works in us a conception of itself*" (DC II.8.2; EW I, 103; emphasis added). If motion is causal power, and causal power is mind-independent, then motion is *also* mind-independent.

The mind-independent reality of both magnitude and motion/rest appears explicitly in Hobbes' account of perception. Hobbes says:

> **The cause of sense, is the external body,** or object, **which presseth the organ proper to each sense** … which pressure, by the mediation of nerves, and other strings and membranes of the body, **continued inwards to the brain** and heart, causeth there a resistance, or counter-pressure, or endeavor of the heart to deliver itself, which endeavor, because *outward*, seemeth to be some matter without. And **this seeming**, or, fancy, i**s that which men call sense** … (Hobbes 1651, I. 1; emphasis added)

A body's ability "to press itself onto our sense organ" is a feature of that body. Since pressure involves motion, Hobbes is telling us that an outward motion gives rise to our inward sensations of external objects. Hobbes continues with a discussion of what John Locke later called secondary qualities:

> And **this seeming or fancy is that which men call sense**, and consists, as to the eye, in a light or colour figured; to the ear, in a sound; to the nostril, in an odor; to the tongue and palate, in a savor; and to the rest of the body, in heat, cold, hardness, softness, and such other qualities as we discern by feeling. **All which qualities called sensible are in the object that causes them** but so many several **motions of the matter** by which **it presses our organs** diversely. Neither in us that are pressed are they **any thing else but diverse motions** (for motion produces nothing but motion). (Hobbes 1651, I. 1; emphasis added)

Notice: Hobbes here says that these secondary qualities are "in the object that causes them" as "several motions of the matter" (likewise, insofar as they are in the human mind, they are ultimately reducible to motion). Motion, it seems, is *really* in the object, apart from our perception, and thus can serve to explain that perception.

Two final passages confirm this interpretation. Hobbes says: "those things which the learned call the accidents of bodies are indeed nothing else but diversity of fancy, and are inherent in the sentient and not in the objects, **except motion and quantity**".[7] What comes before the "except" seems to express Pasnau's interpretation of Hobbes. But then there is the limitation of the "except", which works against an unqualified antirealist reading. Motion, quantity, and magnitude are mind-independent objects, not sentient objects. As Hobbes himself says explicitly: The things that **really are in the world without us** are those **motions** by which these seemings [of perception] are caused" (Hobbes 1640, I. 2.10; emphasis added).

To sum up, we have displayed textual evidence demonstrating that for Hobbes, bodies are mind-independent, and that magnitude (extension) and motion/rest are mind-independent accidents or qualities of those bodies. In light of this evidence, we find ourselves in agreement with Slowik (2014): "despite [Hobbes'] hinting towards phenomenalism as regards bodily accidents (i.e., as they pertain to our cognitive faculties) … the central importance of magnitude and motion in Hobbes' scheme would seem to undermine this more radical line of interpretation" (68).

Motion plays a key role in Hobbes' theory of perception in particular and causation in general. Frithiof Brandt says, "rather than being termed a metaphysical materialist, Hobbes should be called a motionalist, if we may

[7] Pasnau 2011, page 117, footnote 2 references Hobbes' *Seven Philosophical Problems*, VII. 28.

be permitted to coin such a word" (Brandt 1928, 379). Leijenhorst provides a way to reconcile this motionalism with Hobbes' occasional remarks that an accident is just a "mode of conceiving a body".[8] According to Leijenhorst, Hobbes's has two different conceptions of "accident". In the strict metaphysical sense, "an accident is **not** an *objective mode of a body*, but our subjective *mode of conceiving body*" (Leijenhorst 2001, 156; emphasis added). However, Hobbes is also committed to a *realistic conception of accidents* like magnitude and motion, and believes that "the phenomenalist accidents are the fruits of realist accidents" (Leijenhorst 2001, 157; emphasis added).[9] Leijenhorst is correct: Hobbes is not the unqualified eliminativist that Pasnau depicts because primary qualities like magnitude and motion/rest are not equal in their standing with secondary qualities like color, taste, etc. Contra Pasnau, Hobbes is not the radical epitome of the unqualified rejection of all accidents.

Before considering how Pasnau might defend his position against our criticisms, we should note a possible textual objection to our interpretation.[10] When Hobbes takes up the question of how accidents are "in" their subjects, he lists the following attributes as all on par with each other: "to be at rest, to be moved, colour, hardness" (DC II.8.3; EW I, 104). He goes on to insist that "colour, heat, odour . . . and the like" are in their subjects "in the same manner that extension, motion, rest, or figure are in the same", for he insists that "as magnitude, or rest, or motion, is in that which is great, or which resteth, or which is moved… so also, it is to be understood, that every other accident *is in* its subject" (emphasis added). These lines seem to challenge the distinction that we (and Leijenhorst) have drawn between phenomenal/subjective accidents and real/objective ones. If motion and color, for example, are both in a thing in the same way, then how can one be mind-dependent and the other mind-independent?

This objection fails because Hobbes' remarks in the relevant passage are not only consistent with our reading, but also confirm it. Hobbes' claim that all attributes are "in" their subject in the same manner is consistent with drawing distinctions among different kinds of attributes. For example, immediately after he says that "as magnitude… is in that which is great… so also… every other accident is in its subject", Hobbes himself distinguishes between essential and accidental attributes:

[8] Pasnau (2011, 117) references Hobbes's *De Corpore* 8.3.
[9] Pasnau (2011) explicitly rejects Leijenhorst's interpretation of Hobbes.
[10] Thanks to an anonymous referee for EuJAP for bringing this possible objection to our attention.

> … there are certain accidents which can never perish except the body perish also; for no body can be conceived to be without extension, or without figure. All other accidents… as to be at rest, to be moved, colour, hardness, and the like, do perish continually… [and yet] the body never perisheth. (DC II.8.3; EW I, 104)

Essential and non-essential properties are distinct from one another in an important sense even though they are both "in" bodies in the same way. Similarly, it is legitimate to distinguish between subjective phenomenal properties like color and objective properties like motion even though bodies "have" them in the same way.

Such a distinction is not only permitted by the passage in question but is indeed implied by its ending. Hobbes says:

> … as for the opinion that some may have, that all other accidents are not in the bodies in the same manner that extension, motion, rest, or figure are in the same; for example, that colour, heat, odour, virtue, vice, and the like are otherwise in them, and, as they say, *inherent*; I desire they would suspend their judgment for the present, and expect a little, till it be found out by ratiocination, whether these very accidents are not also certain motions either of the mind of the perceiver, or of the bodies themselves which are perceived … (DC II.8.3; EW I, 104-105; emphasis added).

This passage suggests the position that Hobbes affirms explicitly at *Leviathan*, I. 1, and which we quoted above in laying out our argument (see the block quote just before footnote 7): namely, that secondary or phenomenal qualities like color are both in the mind that perceives them and in the thing perceived. They are motions in the mind of the perceiver caused by motions in the perceived external object. Insofar as it is "in" the external object, color is reducible to the motion in the object that causes the subjective perception in the mind. Color and motion are both "in" the object in the same way because, ultimately, color in the object *just is* motion—a mind-independent attribute of the body.

3. Pasnau's Anticipated Response

In response to the evidence we have presented, Pasnau could attempt to maintain his position by noting that Hobbes is a reductionist about motion. Reducing motion to body itself, he might insist, amounts to anti-realism about accidents—including magnitude and motion.

One kind of anti-realism about accidents, Pasnau tells us, is motivated by a reductive account of reality (Pasnau 2011, 499). What is real, for Pasnau's Hobbes, is only body; and, everything that appears to exist is ultimately reducible to body itself. Pasnau attributes this form of anti-realism about accidents to Hobbes, a position he calls "eliminativism".[11] Moreover, Pasnau attributes a "deflationist" position to Hobbes. In his opening statement on deflationary accounts, Pasnau says:

> I use the term 'deflationary' to cover a broad range of views on which **forms are somehow less than full-fledged beings in their own right**, which is to say that they do not exist in the same sense that substances exist. The most extreme sort of deflationist account, which we might call **eliminativism**, is the view that there simply are **no such things as accidental forms.** This strategy has its explicit defenders in the seventeenth century. We have already seen **Hobbes, for instance, endorse this sort of view**, with his remark that **an accident is just "the mode of conceiving a body."** (Pasnau 2011, 181; emphasis added)

Here, Pasnau is claiming that for an eliminativist, there are "no such things" as accidents. Pasnau does not add that for an eliminativist like Hobbes there are no such things as accidents *in the external world*, but this must be what he means. For he goes on to say that Hobbes's form of eliminativism makes accidents "modes of conceiving". If accidents are modes of conceiving, then accidents are something in the mind. So, Pasnau must really mean that eliminativists hold that there are no accidents *external to the mind*. Pasnau says:

> So what exactly is **an accident** for Hobbes, if not one body's inhering in another? He **defines it as "the mode of conceiving a body."** With this, Hobbes is not just making the commonplace switch from talk of accidents to talk of modes, but further giving the notion of mode a subjective character, so that **what counts as a mode depends entirely on how we conceive of a thing**… **accidents are no longer something in bodies distinct** from the substance… t**o grasp a body's accidents just is to grasp something about the body itself**. (Pasnau 2011, 117; emphasis added)

According to Pasnau's interpretation of Hobbes, accidents are distinct from bodies only in our minds; in reality, they are reducible to or identical with

[11] Pasnau, *Metaphysical Themes.* See sections 7.1. and 10.2, and see also page 261.

bodies themselves. To grasp some feature of a body is just to grasp the body itself.

Thinking of motion as activity, Pasnau may argue that body exists externally to one's mind, and so does motion, but the motion (insofar as it is in the external world) is nothing over and above the body itself; rather it just *is* the body. The word "motion" may also refer to a mode of thought (i.e., a "fancy") that may be distinct in thought from the idea of body, but that is not relevant. Pasnau's point may be that when Hobbes considers motion *not* as a conception in the mind, but as something mind-independent, he no longer takes it to be distinct from body. For Pasnau's Hobbes, the substance/accident distinction applies only when human conceptualizing is in play. In the world alone, there is no such distinction: accidents collapse into their substances. In particular, motion is body existing first in one place, and then another.

According to Pasnau's interpretation of Hobbes's reductive project, in the mind-independent world no accident exists distinct from or in addition to bodies. Since Pasnau maintains that Hobbes is a reductionist about all accidents, he might take himself to have defended his claim that Hobbes is an anti-realist about all accidents. For on the reductionist view, accidents—*understood as distinct* from the bodies that possess them—exist only in our thought, not in the mind-independent world.

4. Reply to Pasnau

We maintain our original claim that Pasnau is incorrect to call Hobbes an *unqualified* anti-realist. Pasnau may be correct to call Hobbes a qualified anti-realist, denying the mind-independent existence of some (perhaps most) accidents. However, because Hobbes is not anti-realist about magnitude and motion, he is not an unqualified anti-realist about accidents. In the last section, we speculated that Pasnau might try to preserve his reading by suggesting that Hobbes is a reductionist about all accidents, including magnitude and motion. Here, we will first present evidence suggesting that Hobbes does *not* reduce magnitude and motion to body, and then we will argue that even if he does, such reduction does not amount to anti-realism.

The reductionism under consideration is the view that a body's magnitude and motion are in reality *identical* to the body itself. But in *De Corpore* when Hobbes first gives examples of accidents, he does not seem to identify them with body:

> Let us imagine, therefore, that a body fills any space, or is coextended with it; that coextension is not the coextended body: and, in like manner, let us imagine that the same body is removed out of its place; that removing is not the removed body: or let us think the same not removed; that not removing or rest is not the resting body. What then are these things? They are *accidents* of that body. (DC II.8.1; EW I, 102; emphasis added)

Extension, Hobbes says, *is not* the extended body, nor rest the resting body. Rather than identifying the body with its accidents, he is stressing their distinctness. Perceptive readers might note the opening appeal to imagination and wonder whether this distinction is a distinction in reality for Hobbes, or only a distinction in the mind. However, this passage occurs at the point in the *De Corpore* thought experiment where Hobbes has just reintroduced mind-independent bodies into the world, and is describing the attributes of such bodies. Therefore, he seems to be suggesting that accidents like motion and magnitude are *in reality* not identical with their bodies.

But we need not rest our entire response to Pasnau on this textual evidence. For even if Hobbes *does* reduce motion and magnitude to the moving body, it would not follow that he is an anti-realist about these accidents. Pasnau cannot, therefore, defend his unqualified anti-realist interpretation of Hobbes by defending his reductionist interpretation of Hobbes. Holding a reductionist position on all accidents does not entail an anti-realist position on all accidents.

There is a difference between reductionism and anti-realism. For example, to reduce motion to body is just to say that there is no such thing as motion distinct from or in addition to body. This is the sort of claim Pasnau attributes to Hobbes when he says that Hobbes is a reductionist about accidents. On the other hand, anti-realism about motion would be the claim that motion is in the mind but not the world apart from the mind. In other words, anti-realism about motion would be the claim that the external (mind-independent) world alone cannot ground truths about motion. And Pasnau attributes this claim to Hobbes, also.

However, reductionism about motion does not entail anti-realism about motion. Suppose that bodies are mind-independent, and that motion is identical with a moving body (is nothing over and above that body itself). Consider, for example, a bus. If we speak truly when we say, "the bus is approaching", what grounds this truth? Where is the truth-maker? In the mind or in the world? The truth-maker is the motion of the bus, which is (by hypothesis) identical to the bus itself—a mind-independent body. This

is a case of reductionism, but not of anti-realism, about motion. For in this case, the mind-independent world alone *can* ground truths about motion.

Hobbes may believe that motion is not something distinct from or in addition to body and yet still believe, without contradiction, that there is something external to the mind (namely, body itself) that grounds truths about motion. For body itself is not mind-dependent. So even if (as Pasnau seems to claim) Hobbes is a reductionist about motion, this does not prove that he is an anti-realist about motion.

In our work here and in section two, we aimed to show that Hobbes is not, contra Pasnau's interpretation, an anti-realist about "primary qualities" such as magnitude and motion. We hope to have provided very clear and useful data for further reflections and discussion on the topic.[12]

REFERENCES

Brandt, F. 1928. *Thomas Hobbes' Mechanical Conception of Nature*. Copenhagen: Levin & Munksgaard.

Herbert, G. 1987. Hobbes's Phenomenology of Space. *Journal of the History of Ideas*, 48: 709–717.

Hobbes, T. 1655/ 1981. Part I of *De Corpore*, chapters 1–6, A.P. Martinich (trans.), New York: Abaris Books.

Hobbes, T. 1651/1994. Leviathan. In Leviathan, with selected variants from the Latin edition of 1668, ed. E. Curley. Indianapolis: Hackett.

Hobbes, T. 1640/1990. The elements of law. In *The Elements of Law, Natural and Politic*, ed. J. C. A. Gaskin. Oxford: Oxford University Press.

Hobbes, T. 1839. *The English Works of Thomas Hobbes of Malmesbury*. Ed. W. Molesworth. London: J. Bohn.

Hobbes, T. 1934. Objections to Descartes: Objection II. In *The Philosophical Works of Descartes*, Vol. II. *Objections and Replies*, Set III, translated by S. Elizabeth Haldane and G. R. T. Ross. Cambridge: Cambridge University Press.

Jesseph, D. 2006. Hobbesian mechanics. In *Oxford Studies in Early Modern Philosophy*, eds. D. Garber and S. M. Nadler. pp. 119-152. Oxford University Press.

[12] Thanks to three anonymous referees for helping us improve an earlier draft of this manuscript.

Leijenhorst, C. 2001. *The Mechanisation of Aristotelianism: The Late Aristotelian Setting of Thomas Hobbes' Natural Philosophy*. Brill.

Pasnau, R. 2011. *Metaphysical Themes 1274-1671*. Oxford: Oxford University Press.

Slowik, E. 2014. Hobbes and the phantasm of space. *Hobbes Studies* 27.1: 61-79.

Spragens, T. (Jr.). 1973. *The Politics of Motion: The World of Thomas Hobbes*. Lexington: The University Press of Kentucky.

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IS INCOMPATIBILISM COMPATIBLE WITH FREGEANISM?

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ABSTRACT

This paper considers whether incompatibilism, the view that negation is to be explained in terms of a primitive notion of incompatibility, and Fregeanism, the view that arithmetical truths are analytic according to Frege's definition of that term in §3 of Foundations of Arithmetic, can be held together. Both views are attractive in their own right, in particular for a certain empiricist mind-set. They promise to account for two philosophical puzzling phenomena: the problem of negative truth and the problem of epistemic access to numbers. For an incompatibilist, proofs of numerical non-identities must appeal to primitive incompatibilities. I argue that no analytic primitive incompatibilities are forthcoming. Hence incompatibilists cannot be Fregeans.

Keywords: *Analyticity, arithmetic, falsity, incompatibility, negation*

1. The Problem of Negation and Negative Truth

Some philosophers find negation problematic. It is not difficult to appreciate why. Nothing really corresponds to negation. Nowhere do you encounter negativity: you do not perceive that the sky is not green, that there is no beer in the fridge, that this Riesling is not dry, that this is box does not weigh 5kg. You encounter just what is the case, not also what is not the case. What you see is that the sky is blue, you check what is in the fridge and there is only a bottle of wine, you taste the sweetness of the wine, you weigh the box and the scales' indicator comes to rest at 3kg.

There is only what there is, not also what there is not. So how can we speak truly about the world using negative propositions?

The problem of negation or negative truth has been acutely felt by empiricists. For words to be meaningful, they have to denote something positive, as all that we perceive is positive. Thus the meanings of negative expressions must be derivative of and stem from the meanings of positive ones, and negative truths must be secondary to and explained in terms of positive truths. Hobbes expresses this thought in his *Elements of Philosophy*:

> The positive names are prior to the negative ones, because, unless the former existed beforehand, there could be no use of the latter. (Hobbes 2000, Part 1, Chapter 2, §7)

Locke concurs and writes that

> negative or privative words cannot be said properly to belong to, or signify no ideas: for then they would be perfectly insignificant sounds; but they relate to positive ideas, and signify their absence. (Locke 1979: Book III, Chapter 1, §4)

Ayer, grappling with the distinction between negative and affirmative statements, concludes that, although negative statements cannot be reduced to affirmative ones because the former are less specific than the latter,

> logically a negative statement […] can be verified only through the truth of some more specific statement which entails it; a statement which will itself, by contrast, be counted as affirmative. (Ayer 1952, 815)

Ayer continues, drawing attention to a metaphysical aspect of his conclusion, that

> in the same way we can account for the inclination that many people have towards saying that reality is positive. The explanation is that any information which is provided by a less specific statement will always be included in the information provided by some more specific statement. (*Ibid*.)

Ayer describes this inclination quite neutrally, which indicates that, although a particularly natural component of the empiricist line of thought, the view is attractive also before other metaphysical backgrounds.

2. Incompatibilism

One attempt at explaining negative truth or negation in terms of positive notions is almost immediately forthcoming. If the sky is blue, then it is not green, because being blue excludes it from being green; if the fridge is full of wine, its contents exclude bottles of beer from being in it; the sweetness of the wine excludes it from being dry; if something weighs only 3kg, this excludes it from weighing 5kg. Negation can be explained in terms of what things are and what properties exclude each other or which properties are incompatible with each other. For '*a* is not *F*' to be true, it suffices for *a* to have a property *G* which is incompatible with *F*. The puzzle dissolves, because negation is not a primitive concept, but one that is explained in terms of incompatibility.

Demos offers an extended discussion of the problem of negation and its solution in terms of a primitive notion of incompatibility in an empiricist setting. According to Demos, "a negative proposition constitutes description of some true positive proposition in terms of the relation of opposition which the latter sustains to some other positive proposition" (Demos 1917, 194), where opposition is the notion of incompatibility introduced in the last paragraph. More recently, Huw Price has argued in a similar spirit that "the apprehension of incompatibility [is] an ability more primitive than the use of negation" (Price 1990, 226). Price, like Demos, proposes to explain negation in terms of incompatibility:

> It is appropriate to deny a proposition *P* (or assert ~*P*) when there is some proposition *Q* such that one believes that *Q* and takes *P* and *Q* to be incompatible. (*Ibid*. 231)

I call the view that negation is to be explained in terms of a primitive notion of metaphysical incompatibility *incompatibilism*.[1]

Let's put some more flesh on incompatibilism. Russell (1951, 297) reports that Wittgenstein once refused to accept that there was no hippopotamus in a lecture room in Cambridge. Neither is there a hippopotamus in the

[1] Price appeals to a further primitive in his explanation of negation, namely a primitive speech act of denial. The crucial thought, however, is that negation is based on incompatibility. Negation, according to Price (2019, 6), is needed only for pragmatic reasons, to enable speakers to register explicitly and to convey to other speaker that they consider two propositions to be incompatible. Similarly, Rumfitt (2000) appeals to a notion of incompatibility, albeit between speech acts, rather than propositions, in his bilateral account of logic. Restall (2005, 6ff), too, appeals to a notion of incoherence, that of asserting and denying the same proposition.

room I am in now. Cheyne and Pigden explain that the "great big positive fact (or collection of facts)" *the room as it actually is* makes it true that there is no hippopotamus in it. Their "claim is that the existence of this fact [...] necessitates or makes true the proposition that there is no hippopotamus in the room" (Cheyne and Pigden 2006, 255). Had there been a hippo in the room, that fact would not have existed. Containing intact furniture, books on shelves, an unscathed philosopher etc., is incompatible with a room containing a hippo. The things or facts there are suffice to explain negative truths. As another example, suppose Theaetetus is not flying, but sitting next to Socrates. Then

> the big fact (or collection of facts) that we can roughly characterize as *Theaetetus as he actually is* necessitates the truth of [Theaetetus is not flying]. For if Theaetetus *were* flying this fact would not exist. Thus positive facts constituting what Theaetetus *is* doing necessitate negative truths about what he is *not* doing. (*Ibid*., 259)

Negative truth is explained in terms of the things there are and what they exclude or with what they are incompatible.

Veber, too, emphasises that very large, positive, facts, are the truthmakers of negative truths.

> If the truth of *Q* is incompatible with the truth of *P* then *P* will entail Not-*Q* and thus *P*'s truthmaker will function as Not-*Q*'s truthmaker as well. Provided that every negative truth is entailed by some set of positive truths with positive truthmakers, negative truths can be made true by positive facts. (Veber 2008, 82)

That neither the Great Wall of China nor a golf ball are in my coffee cup is due to certain positive facts. In the first case, "that the cup has certain dimensions and that the Wall has certain dimensions are metaphysically incompatible with the Wall being contained in the cup" (Veber 2008, 83). The dimensions of the cup and the Great Wall of China are positive facts. Concerning the golf ball and the cup, "truths about the distribution of air (or coffee) molecules inside the cup" and what the golf ball is made of are incompatible with the golf ball being in the cup. Golf balls are made of "rubber or hard plastic" and that "an air (or coffee) molecule is located in a certain place at a certain time is incompatible with a molecule of rubber or hard plastic being there" (Veber 2008, 83). Thus, only positive facts and what they are incompatible with are needed as the truthmakers of the negative truth that there is no golf ball in my coffee cup.

The view that negation can be explained in terms of incompatibility is interesting, well motivated and attractive. To put it more sharply into focus and to illustrate the advantages of the incompatibilist view, let's compare it briefly with the solution that Russell favoured at some point in his thinking: that there are negative facts.[2]

3. Against Negative Facts

Russell argued that there are two kinds of facts.

> Let us suppose, for the sake of illustration, that *x* has the relation *R* to *y*, and *z* does not have the relation *S* to *w*. Each of these facts contains only three constituents, a relation and two terms; but the two facts do not have the same form. In the one, *R* relates *x* and *y*; in the other, *S* does not relate *z* and *w*. It must not be supposed that the negative fact contains a constituent corresponding to the word "not." It contains no more constituents than a positive fact of the correlative positive form. The difference between the two forms is ultimate and irreducible. We will call this characteristic of a form its quality. Thus facts, and forms of facts, have two opposite qualities, positive and negative. (Russell 1919a, 4)

Russell argued that Demos' view has no methodological advantage, and in fact some disadvantages, over the view that there are negative facts, and that it is circular, if the aim is to avoid negative notions, as incompatibility is itself negative (*Ibid*., 5f).

Not many philosophers are satisfied with the view that there are negative facts. Even Russell himself was not entirely convinced: in *The Philosophy of Logical Atomism* (Russell 1919b, 42), Russell is less committal and merely asks his audience to consider the possibility that there are negative facts in addition to positive ones.

Demos aimed to explain negative true propositions without having to introduce negative facts. According to Demos,

> the reason why such a view must not be entertained is the empirical consideration that strictly negative facts are nowhere to be met with in experience, and that any knowledge of a negative nature seems to be derived from perception of a positive kind. (Demos 1917, 189)

[2] The discussion of negative facts was added at the request of a referee.

A congenial view is expressed by Grzegorczyk in a paper giving an interpretation of intuitionist logic as the logic of scientific research: the atomic sentences of the language are established as true or otherwise by a method of enquiry, while

> the compound sentences are not a product of experiment, they arise from reasoning. This concerns also negations: we see that the lemon is yellow, we do not see that it is not blue. (Grzegorczyk 1964, 596)

The negations of sentences are not verified directly, but their verification involves reasoning.[3]

Another reason to reject the existence of negative facts is that for each positive fact there are uncountably many negative facts. There would be, besides the facts of the contents of my room, also the negative facts that there is no hippo in it, no rhinoceros, no blackbird, no giraffe, besides the facts of its location, there would also be the negative facts that it is not in Madrid, not in Paris, not in Berlin, not in Warsaw etc. That is just too many facts. It is a demand of ontological economy that if the phenomena can be explained without appeal to negative facts, then this is what we should do. Arguably, an account such as Cheyne's and Pigden's or Veber's succeeds in doing precisely that, and so the existence of negative facts should be rejected.

Another reason against accepting negative facts is the following. Suppose the cat is on the mat. Then that fact can be said to be located where the cat and the mat are. But suppose the cat is not on the mat. Where is the negative fact located? Where the cat is? Where the mat is? Where both are? Neither answer is particularly attractive. Negative facts do not appear to be located anywhere. But something that is not located in space presumably also cannot enter the causal nexus of the world. Negative facts would then not do any causal work and have no causal effects on the world, and as such, on plausible metaphysical assumptions about causality and the physical world, they would not be part of it. Negative facts would serve no purpose in the world, but they were introduced as supposedly on a par with positive facts, which undoubtedly serve a purpose.[4]

Incompatibilism is a view as general as the problem it aims to solve. The problem of negative truth isn't one exclusively for empiricists. Some philosophers may simply share the sentiments Mumford expresses,

[3] I owe the reference to Grzegorczyk to a referee for this journal.
[4] For further development of this argument, see Molnar (2000, 76ff).

according to whom negative facts, to which negative truths would appear to correspond, are

> too mysterious to be taken seriously. ['Everything that exists is positive'] has almost a ring of aprioricity about it. How can these facts exist and be negative? Indeed, how can any existent really be negative? (Mumford 2007, 49)

Mumford's description is, just like Ayer's quoted earlier, quite neutral, which indicates that the problem is not specifically tied to a correspondence theory of truth either. Existence itself seems to be essentially positive. Nothing negative exists. The problem of negative truth is a very ancient and general one. A closely related problem, the problem of how there can be false speech or thought, posed itself already to Parmenides, who warns us that

> never shall this be forcibly maintained, that things that are not are, but you must hold back your thought from this way of enquiry, nor let habit, born of much experience, force you down this way, by making you use an aimless eye or an ear and tongue full of meaningless sound: judge by reason the strife-encompassed refutation spoken by me. (Kirk, Raven and Schofield 1983, 248, Fragment 294)

Parmenides concludes: "What is there to be said and thought must needs be: for it is there for being, but nothing is not" (*Ibid*., 247, Fragment 293). But then 'false speech' or 'false thoughts' are meaningless and neither speech nor thought at all. The ancient problem of falsity received profound systematic treatment and conceptual clarification by Plato. In the middle section of the *Sophist,* the Eleatic Stranger is lead to commit "the patricide of father Parmenides" and to "insist by brute force both that *that which is not* somehow is, and then again that *that which is* somehow is not" (Plato 1997, 241d). In the *Euthydemos*, Socrates encounters two sophists who deny the possibility of false thoughts and disagreement.[5] Plato's vivid presentation of the perplexities surrounding negation, falsity and negative truth challenges philosophers of any background to address the problem. The issues discussed here apply to a wider range of positions than just some

[5] For a commentary on the *Euthydemos*, see McCabe (forthcoming). I comment on the commentary in the same volume.

forms of empiricism. For the purposes of illustration, however, I confine consideration to empirically minded philosophers.[6]

4. Fregeanism

Reference to and knowledge about numbers is also something many philosophers have found problematic, maybe even more so than negation. This, too, is a problem that is particularly acute for empiricists, for whom reference and knowledge must ultimately be explained in terms of sense perception and causal relations between speakers or thinkers and objects referred to or known about. We do not experience numbers in sense perception and we cannot stand in causal relations to them, as they are abstract objects. So how can we refer to them, let alone know anything about them? Maybe empiricists are even forced to admit that there are no numbers at all, which makes the ubiquity, usefulness and applicability of propositions apparently about them even more of a mystery.

Frege, although himself not touched by empiricist worries, formulated an attractive starting point for a solution. The logicist view that arithmetical truths are analytic opens up prospects for explaining how we manage to refer to numbers even though they are abstract objects by explaining numerical identities in terms of one-to-one correlations, or even of explaining away reference to numbers altogether. According to the characterisation of numerical identity that Frege attributes to Hume in *Foundations of Arithmetic* §63, the number of *F*s equals the number of *G*s if and only if there is a one-to-one correspondence between the *F*s and the *G*s. Letting # abbreviate 'the number of' and ∃! 'there is exactly one', what is often called *Hume's Principle* has the following formalisation:

$$\#xFx = \#xGx \equiv \exists R\,(\forall x(Fx \rightarrow \exists!y(Gy \,\&\, Rxy)) \,\&\, \forall y(Gy \rightarrow \exists!x(Fx \,\&\, Rxy)))$$

[6] There are of course also empirically minded philosophers who have no problem with negation. I have already mentioned Russell. Aristotle, too, has no qualms about appealing to negation in the formulation of the most certain and fundamental principle in *Metaphysics* Γ.3, that "the same attribute cannot at the same time belong and not belong to the same subject in the same respect" (Aristotle 1985, 1005ba19-20). Mill also belongs to this group: "When the positive name is connotative, the corresponding negative name is connotative likewise; but in a peculiar way, connoting not the presence but the absence of an attribute. Thus, not-white denotes all things whatever except white things; and connotes the attribute of not possessing whiteness. For the non-possession of any given attribute is also an attribute, and may receive a name as such; and thus negative concrete names may obtain negative abstract names to correspond to them" (Mill 1882, 41f). For opposition to the incompatibilist account of negation, see Armstrong (2004, 55ff), Kürbis (2019, Ch. 4), Molnar (2000), Taylor (1952, 1953). The last paper is a response to a paper of Ayer's on negation quoted earlier. For a commentary on Molnar's paper, see Kürbis (2018).

For ease of exposition, we can additionally require that ∀x∀y(*Rxy* → *Fx* & *Gy*), so that *R* is a relation the *domain* of which are the *F*s and the *range* of which are the *G*s.

Russell's version of logicism was sympathetic to empiricism. Carnap explicitly thought that logicism provides an approach to solving the problem of reference to numbers in an empiricist setting. Carnap describes how he

> had learned from Frege that all mathematical concepts can be defined on the basis of the concepts of logic and that the theorems of mathematics can be deduced from the principles of logic. Thus the truths of mathematics are analytic in the general sense of truth based on logic alone. [...] It became possible for the first time to combine the basic tenet of empiricism with a satisfactory explanation of the nature of logic and mathematics. (Carnap 1963, 46f)

Hale and Wright developed Frege's thoughts in a direction which, although they themselves may not be motivated purely by empiricist worries either, can plausibly be appropriated by empiricists. Their aim is to explain

> how statements of a given kind can be understood as involving reference to abstract objects and can yet remain, at least in principle, humanly knowable, given that the objects they concern are outside space and time and in consequence can stand in no sort of epistemologically relevant, causal relations to human knowers. [...] A statement of numerical identity---in the fundamental case, a statement of the kind: the number of *F*s = the number of *Gs*---is true, if true, in virtue of the very same state of affairs which ensures the truth of the matching statement of one-to-one correspondence among concepts, and may be known *a priori* if the latter may be so known. (Hale and Wright 2002, 118f)

Despite Frege's own nonchalance regarding epistemological concerns, logicism provides philosophers reluctant to posit a special faculty of the mind to account solely for our capacity of reference to and knowledge about numbers, be it Kantian or Gödelian intuition, with an attractive account of how we, as physical beings situated in space and time, nonetheless manage to have epistemic access to numbers.

In *Foundations of Arithmetic*, Frege also provided appealing definitions of *a priori*, *a posteriori*, synthetic and analytic:

> It is necessary to find a proof [of a proposition] and to follow it down to the primitive truths. If in that process all that is met with are the general logical laws and definitions, then the truth is analytic [...] If, however, it is not possible to give a proof without appealing to truths which are not of the general logical kind, but are related to a special field of knowledge, then the sentence is synthetic. For a truth to be *a posteriori* we require that its proof cannot proceed without appealing to facts, i.e. to unprovable truths without generality that contain statements about specific objects. If, on the other hand, it is possible to give a proof from purely general laws that can neither be proved nor stand in need of proof, then the truth is *a priori*. (Frege 1990, §3)

For want of a better term, I shall call the view that arithmetical truths are analytic *in Frege's sense Fregeanism*. The terminology is not supposed to suggest that Fregeanism incorporates all of Frege's philosophy. It is only a thesis on the nature of mathematical truths and the definitions of *a priori*, *a posteriori*, synthetic and analytic. In my terminology, Frege is of course a Fregean, but Fregeans need not accept all of Frege's views. The most promising way of spelling out Fregeanism is to count Hume's Principle as analytic, but philosophers who accept Hume's Principle as analytic need not be Fregeans in my terminology, if they do not accept Frege's definition of analyticity.

Fregeanism is independent of empiricism. However, as Carnap's position or an empiricist Neo-Fregeanism are well motivated, for the purposes of this essay I am interested in an empirically minded Fregean. I do not require my empiricist to reject the existence of abstract objects outright, but only that he does not accept their existence lightly: a philosopher who demands a strong argument, ideally a proof, before accepting the existence of a particular kind of abstract object, and hence who does not just accept that there are numbers, but demands that this must be established.

5. Incompatibilist Fregeanism

Fregeanism and incompatibilism deserve and have received serious consideration. They are initially plausible and provide promising ways of accounting for philosophically puzzling phenomena, especially in a

broadly empiricist setting. Some philosophers may wish to accept both views. I will argue that, attractive though it is, this position is problematic.[7]

Consider '*a* is red and green all over'. By Frege's definition, it is neither synthetic nor analytic, neither *a priori* nor *a posteriori*, as it is not true: being red is incompatible with being green all over. Only true propositions are classified by Frege's definition: false propositions do not have proofs, and to classify a proposition, it is necessary to find a proof of it, says Frege. That is slightly unusual, but it is merely a slightly unusual use of terminology. We can amend the definition by stipulating that false propositions belong to the same categories as their negations.

The axioms of logic are *a priori*. Axioms of logic are propositions which can neither be proved nor do they stand in need of proof (from something else), while at the same time they are proved from purely general laws: they are their own one-step proofs. The same can be said of 'Being red is incompatible with being green all over'. It is a primitive, general law expressing a truth that anyone who has mastered the concepts 'red' and 'green' is in a position to recognise. Thus it is *a priori*. But its (one-step) proof is related to a special field of knowledge, namely colours, so it is *synthetic*.[8] Arguing indirectly, 'Being red is incompatible with being green all over' cannot be anything but synthetic *a priori*. It is not *a posteriori*, as it does not contain reference to specific objects. It does not follow from

[7] My aim is to map out logical space and assess the general prospects for combining two views, while avoiding the details of how any particular philosopher might combine them. The possibility of combining incompatibilism and Fregeanism has not attracted much attention in the literature. However, Neil Tennant accepts both, logicism and incompatibilism (see Tennant 1987, 1999, 2009). Various members of audiences to whom I presented this paper have expressed sympathy for the combination. I'll say a few words about Tennant in a later footnote. Although Tennant's approach is attractive and elegant, discussing it in more detail here would distract from what is at issue. His explanations of concepts of arithmetic may strike some readers as problematic for reasons independent of my concerns in this paper, as he appears to define the concept 'the number of' and '0' at the same time.

[8] This is plausible independently of Frege's definitions. Maybe most people who accept that there are synthetic *a priori* truths agree that "Being red is incompatible with being green all over" is an example. On a Kantian definition, it is synthetic, because *is incompatible with being green all over* is "outside the concept" *being red* and it "add[s] to the concept of the subject a predicate which has not been in any wise thought in it, and which no analysis could possibly extract from it" (Kant 2010, A 7/B 11). Having grasped the concepts *red*, *green* and *incompatible* suffices to grasp that being red is incompatible with being green. It is something that "our faculty of knowledge supplies from itself", hence it is *a priori*. Besides, "Being red is incompatible with being green all over" carries with it a kind of necessity that, according to Kant, *a posteriori* knowledge cannot have.

only general logical laws and definitions, so it is not analytic. Assuming every truth can be classified by Frege's definitions, it is synthetic *a priori*.

If establishing the incompatibility of *F* and *G* appeals to a special field of knowledge concerning the properties *F* and *G*, then 'Being *F* is incompatible with being *G*' is synthetic *a priori*. Frege's definitions assume that if there is a proof of a proposition, there is one in which every step is made explicit according to the axioms of the system and the additional assumptions necessary to derive the proposition. If negation is defined in terms of incompatibility, any such fully analysed proof of a proposition $\sim A$ must appeal to propositions about incompatibilities. If these propositions are synthetic, $\sim A$ itself is synthetic.

A Fregean can employ an axiomatisation of logic in which negation is primitive. The incompatibilist needs to adopt one in which incompatibility is primitive. Proofs in second-order logic plus Hume's Principle remain valid for the incompatibilist Fregean, but they require analysis into more basic steps where any appeal to negation is replaced by an appeal to incompatibility. As by the Fregean definition fully analysed proofs are decisive for establishing whether a proposition is analytic or synthetic, *a priori* or *a posteriori*, although arithmetical propositions certainly remain *a priori*, because the newly analysed proofs will only appeal to purely general laws that can neither be proved nor stand in need of proof, to ensure that they remain analytic, the incompatibilist Fregean needs to avoid appeal to propositions that refer to a specific field of knowledge. Incompatibilism is motivated by examples such as 'Being red is incompatible with being green', which involve properties of physical objects. These would not do for arithmetic, as arithmetic is not tied to the existence of colours. An incompatibilist could extend the account of negation to arithmetic by appealing to primitive incompatibilities involving the numbers, such as 'Being identical to 1 is incompatible with being identical to 2'. However, these appeal to a special field of knowledge, namely the numbers, and thus any proposition proved by appeal to them would be synthetic. Thus this route is not open to the Fregean incompatibilist. The fundamental idea of Frege's logicism was that names referring to numbers are not primitive, but defined in purely logical terms. In other words, the Fregean incompatibilist must assume that there are propositions of the form 'Being *F* is incompatible with being *G*' which are analytic, *i.e.* that there are purely logical properties that are incompatible with each other.

6. Are there Analytic Incompatibilities?

As numerical identities are explained in terms of Hume's Principle, we might expect numerical non-identities to be provable on the basis of incompatibilities involving one-to-one mappings. Let's consider an example of the kind Frege uses to motivate his account. Suppose you're laying the table. You map the knives and forks one-to-one onto each other and attempt to map them one-to-one onto the plates. You fail and one plate is left over. You have discovered that the forks and knives are equinumerous, but that the plates are not equinumerous to them. Trying to express the non-identity 'The number of plates is not identical to the number of knives' in terms only of what things are and incompatibility, we could say that being that left over plate is incompatible with being mapped onto a knife and fork. Generalising, attempting to map *F*s and *G*s one-to-one onto each other leads sometimes to success, sometimes to frustration. If the number of *F*s is not identical to the number of *G*s, attempting to map the *F*s one-to-one onto the *G*s will always leave some *G*s or *F*s out.

Arithmetic cannot be based on an activity of mapping, anymore than it can be based on the activity of laying the table. If we appeal to a mental faculty of carrying out such mappings or mathematical constructions in the abstract, it looks as if we once more appeal to a special field of knowledge, so that propositions about incompatibilities between sizes of sets turn out to be synthetic. The incompatibilist Fregean should follow a similar path to Frege's and use the example as purely heuristic to motivate a general account suitable for the foundations of arithmetic. Following this line of thought, the incompatibilist Fregean needs to specify purely logical primitive incompatibilities between sizes of sets that can be appealed to in establishing numerical non-identities.

Let's assume that there are more *G*s than *F*s. Then for any one-to-one relation *R* with the *F*s as domain, for every *F*, there is exactly one *G* such that *R* relates them, but there are some *G*s which are not identical to any of those that are related by *R* to an *F*. The incompatibilist Fregean needs a general characterisation of one-to-one relations that map the *F*s into but not onto the *G*s in terms of incompatibility and without using negation. It must apply to all cases in which there is no one-to-one relation between *F*s and *G*s. Only then can we expect to be able to *prove* that such incompatibilities hold, independently of being able to carry out certain constructions or not. It is not enough to say that assuming there to be a one-to-one correlation entails two incompatible statements: what these might be is precisely the question we are trying to answer. The incompatibilities we are looking for need to be general, so we cannot rely on some

characterisation involving the particular natures of the *F*s and the *G*s. It would be too general to lay down that 'Being one of the *F*s is incompatible with being one of the *G*s', which is true if there are as many green as there are red things. We might try the following: If for any relation *R*, *R*'s being a one-to-one mapping onto the *F*s is incompatible with *R*'s being a one-to-one mapping onto the *G*s, we can conclude that there is no one-to-one mapping of the *F*s onto the *G*s and that the number of *F*s is not identical to the number of *G*s. This, though, is not an incompatibility that can simply be appealed to in a proof: it is itself the kind of thing that stands in need of proof.

Let's go back to the heuristic point that some *G*s are 'left over' by any one-to-one mapping *R* of the *F*s into the *G*s. Being one of those *G*s is incompatible with *R* mapping an *F* to it. This isn't good enough, as we cannot always indicate the *G*s, but it shows that we need to draw a general distinction between two kinds of *G*s: between those such that *R* maps some *F* to them and the others. The problem the incompatibilist faces is that they cannot use negation, as we normally would, to draw general distinctions. The most obvious differentiation between the two kinds of *G*s is that one kind of *G* is such that *R* relates an *F* to them, while the other *G*s are not of that kind, but that makes use of negation. We might try the following: being one of the *G*s to which *R* relates an *F* is incompatible with being one of the other *G*s. But that still requires a specification of a way of establishing the otherness of those *G*s, and besides, what could 'being other' mean other than 'not being identical to any of those'. As a final attempt, for any one-to-one relation *R*, there is a *G* such that being the value of *R* for an *F* is incompatible with being it. But even waiving worries about what 'being incompatible with being it' might mean, the problem remains of how to establish in general that this is the case for a given *G*.[9]

To solve these difficulties, the incompatibilist Fregean might introduce a further notion: difference. We can then say there are some *G*s which are different from those *G*s such that *R* relates an *F* to them. Doing so is of course to admit that incompatibility alone is insufficient, as a further

[9] Tennant's system suffers from exactly this problem: his account of the "badness" of $\bot$ ties it firmly to "*various ways that we understand the world simply cannot be*" (Tennant 1999, 217), which are synthetic truths. No attempt is made to specify any analytic absurdities. In his formalisation of arithmetic, he helps himself to $\bot$ in the rules for 0 and for one-to-one relations into, but not onto (Tennant 1987, 277ff, cf. also Tennant 2009). The rules are of course formulated generally, but this generality does not get us any further, if it only ranges over the examples of incompatibilities given by Tennant, which are synthetic *a priori*.

primitive is needed for a satisfactory theory. More importantly, however, there is a crucial difference between difference and incompatibility. We have introduced 'difference' merely to avoid using 'not': it has no further content than 'not identical'. By contrast, incompatibility is a rich and interesting notion: there is an attempt at giving it content independently of our interest in negation. The metaphysics of colours gives rise to some of them being incompatible with each other. Other properties exhibit a similar phenomenon. Difference, on the other hand, appears to have no other content than non-identity and as an additional primitive it is just 'not identical' rewritten into one word. The move of adding a primitive notion of difference is rather desperate. It is either *ad hoc* or a thinly veiled appeal to negation.[10]

Contrary to expectation, one-to-one correspondences are not a promising source of analytic incompatibilities. But maybe there are others. Frege accepted that there are two logical objects, the True and the False, so that **T** = **F** is a logical falsehood. However, such an approach is not congenial to an incompatibilist: if there are such objects, we might as well define negation in terms of them rather than incompatibility. It may be that an incompatibilist can accept the existence of these two logical objects, but then the burden of proof is clearly on the incompatibilist to provide such an account and establish its superiority over an account that begins with truth and falsity.

There is a more general point here. The use of classical truth tables is not congenial to the incompatibilist account. Classical truth tables appeal to independently given notions of truth and falsity. '*A*' is false if and only if '~*A*' is true, hence anyone finding negation problematic will find falsity problematic, too. The incompatibilist aims to explain negation in terms of incompatibility: ~*A* is true if and only if there is some true proposition incompatible with *A*. The same explanation will work for falsity, using the former equivalence. So on the incompatibilist account, falsity is to be explained, just like negation, in terms of incompatibility. Besides, Price observes that giving the meaning of negation in terms of its truth table also depends on a primitive notion of incompatibility, as it "clearly depends on

[10] One might even go further, as suggested by a referee, and observe that the statement that *R* is a one-to-one correspondence between the *F*s and the *G*s involves an implicit appeal to negation: *R* maps different *F*s to different *G*s, and to say that *x* and *y* are different is to say that *x* and *y* are not identical, which appeals to negation. Thus right from the start, a logicism building on Hume's Principle is incompatible with incompatibilism. However, an incompatibilist like Tennant would deny that the concept of one-to-one correspondence implicitly appeals to negation, as negation is not appealed to in Tennant's rules for one-to-one correspondence: those rules are entirely positive.

our knowing that truth and falsity are incompatible" (Price 1990, 226). Nonetheless, incompatibilism is not biased against classical logic. The references to Grzegorczyk and Tennant in the current paper may suggest that an incompatibilist view is more congenial to intuitionist, rather than classical, negation. There are, however, also incompatibilists who have no qualms about accepting classical logic. Price is one of them. Demos, Cheyne, Pigden and Veber express no hesitations about classical logic. Peacocke (1987, 163f) argues that his explication of the meaning of negation in terms of primitive incompatibility validates double negation. Brandom (2008, 126f) is a further example of a classicist incompatibilist.

According to an influential generalised treatment of negation discussed by Dunn, the negations of propositions are evaluated in terms of a primitive incompatibility relation $\perp$ between states, situations or possible worlds:

$\chi \vDash \sim p$ if and only if $\forall \alpha(\alpha \vDash p$ implies $\alpha \perp \chi)$

Intuitively, "$\perp$ is to be thought of as a kind of incompatibility relation, *i.e.*, $\alpha \perp \chi$ means that α asserts something which χ denies" (Dunn 1993, 332). One might try to appropriate this explanation to the present case to search for analytic incompatibilities, and say that $\alpha \perp \chi$ holds in case α and χ contain propositions that are metaphysically incompatible. This, however, this still leaves the crucial question unanswered. $\sim p$ will only count as analytically true at a world χ if the incompatibility relation amongst worlds may hold as a matter of analytically incompatible propositions being asserted at each world. So unless analytic incompatibilities are forthcoming independently of the definition of when the negation of a proposition is true at a world, so that we can say that there are cases where α asserts a proposition that is analytically incompatible with a proposition that χ asserts, the definition is not going to produce analytically true negations.[11]

Another option for an analytic incompatibility might be 'Everything is identical to everything'. For Frege, at least, this is a logical falsehood that can be formulated without using negation. It is false because there are at least two objects, the True and the False. Even better, Hume's Principle entails that there are infinitely many objects. But this is not a suitable answer for an incompatibilist Fregean. The reason why 'Everything is identical to everything' is logically false is that there are at least two *different* objects. Hume's Principle only entails the existence of infinitely

[11] The discussion of Dunn was added in response to a request by a referee.

many objects if we have a means of expressing that there are different objects, and the proof appeals to negation in the definition of 0 as the number of things equinumerous to the non-self-identical ones. Even if we contrived a new concept 'being incompatible with being itself', this still leaves the question of how to secure that being equinumerous to the objects falling under that concept is not equinumerous to the number of things falling under the concept 'identical to 0'.[12] As argued, adding a primitive notion of difference to secure this is unconvincing.

As a final attempt, one might observe that in second order logic it is possible to express logical falsehoods without using negation, as the *falsum* constant $\perp$ is definable as $\forall p \,.\, p$, and that it is possible to prove that there are at least two different concepts or properties, one under which everything falls and one under which nothing false, so that 'All concepts are identical' or 'All properties are identical' can serve as an analytic falsehood that does not appeal to negation. The crux here, however, as before, lies with 'different'. 'All concepts are identical' or 'All properties are identical' is absurd only if there are two different concepts or properties, that is to say, two concepts or properties that are not identical. Besides, to say that there is a concept under which nothing falls blatantly appeals to negation. That all propositions are true is also absurd only if there are at least two different propositions, one true and one false, or one incompatible with the other.[13] The former may be true as a matter of logic, but it relies on the notion of difference, hence negation, and besides, it appeals once more to independently given notions of truth and falsity, which, as argued, is no good for the incompatibilist Fregean. The latter option just reiterates the problem: those two incompatible propositions would have to be analytically incompatible to be of use to the incompatibilist Fregean, and we have not been able to find any such propositions.

7. Conclusion

No analytic incompatibilities are forthcoming. The conclusion suggests itself that the only propositions that are analytically incompatible are analytic propositions and their negations.[14] But this is no good for the incompatibilist Fregean, who aims to define negation in terms of

[12] Cook and Cogburn (2000, 10f) make a related point that defining $\sim A$ as $A \rightarrow 0{=}1$ is not sufficient, as there are acceptable intuitionist theories that verify the Peano Axioms, but also 0=1.

[13] For further discussion of an attempt to define negation in terms of $\perp$, see Kürbis (2015).

[14] As observed by a referee.

incompatibility and is in need of analytic incompatibilities for the foundations of mathematics. So it looks very much as if incompatibilism is incompatible with Fregeanism.

I conclude that Fregean incompatibilism, if not incoherent, has tricky questions to answer. The burden of proof is certainly on the Fregean incompatibilist to make the case that the position is tenable. Of course, it would be possible to adopt different definitions of 'analytic' and 'synthetic'. But that would not change the fact that much of arithmetic on an incompatibilist account would turn out to be synthetic according to Frege's definition. And hasn't Frege himself given good reasons against taking arithmetic to be synthetic according to his definition?[15]

REFERENCES

Aristotle 1985. Metaphysics. In *The Complete Works of Aristotle,* ed. J. Barnes, 1552-1728. Princeton: Princeton University Press.

Armstrong, D. 2004. *Truth and Truth-Makers*. Cambridge: Cambridge University Press.

Ayer, A. J. 1952. Negation. *The Journal of Philosophy* 49: 797–815.

Brandom, R. 2008. *Between Saying and Doing*. Oxford: Oxford University Press.

Carnap, R. 1963. Intellectual autobiography. In *The Philosophy of Rudolf Carnap*, ed. P. A. Schilpp, 3–84. LaSalle: Open Court.

Cheyne, C. and C. Pigden 2006. Negative truths from positive facts. *Australasian Journal of Philosophy* 84: 249–265.

Cook, R. T. and J. Cogburn 2000. What negation is not: Intuitionism and '0 = 1'. *Analysis* 60: 5–12.

Demos, R. 1917. A discussion of a certain type of negative propositions. *Mind* 26: 188–196.

Dunn, J. M. 1993. Star and perp: Two treatments of negation. *Philosophical Perspectives* 7: 331–357.

Frege, G. 1990. *Die Grundlagen der Arithmetic. Eine logisch-mathematische Untersuchung über den Begriff der Zahl*. Hildesheim, Zürich, New York: Olms.

Grzegorczyk, A. 1964. A philosophically plausible formal interpretation of intuitionistic logic. *Indagationes Mathematicae* 26: 596–601.

Hale, B. and Wright, C. 2002. Benacerraf's dilemma revisited. *The European Journal of Philosophy* 10: 101–129.

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Hobbes, T. 2000. *Elementa Philosophiae I: De Corpore*. Paris: Vrin.
Kant, I. 2010. *Kritik der reinen Vernunft*. Hamburg: Meiner.
Kirk, G., J. Raven, and M. Schofield 1983. *The Presocratic Philosophers*. Cambridge: Cambridge University Press.
Kürbis, N. 2015. What is wrong with Classical Negation? *Grazer Philosophische Studien* 92: 51-86
Kürbis, N. 2018. Molnar on truthmakers for negative truths. *Metaphysica* 19: 251-257
Kürbis, N. 2019. *Proof and Falsity. A Logical Investigation*. Cambridge: Cambridge University Press.
Kürbis, N. forthcoming. The importance of being erroneous. *Australasian Philosophical Review* 3.2
Locke, J. 1979. *An Essay Concerning Human Understanding*. Oxford: Oxford University Press.
McCabe, M. M. forthcoming. First chop your *logos* … Socrates and the sophists on language, logic and development. *Australasian Philosophical Review* 3.2
Mill, J. S. 1882. *A System of Logic* (8th ed.). New York: Harper & Brothers.
Molnar, G. 2000. Truthmakers for negative truths. *Australasian Journal of Philosophy* 78: 72–86.
Mumford, S. 2007. Negative truth and falsehood. *Proceedings of the Aristotelian Society* CVII: 45–71.
Peacocke, C. 1987. Understanding the logical constants. A realist's account. *Proceedings of the British Academy* 73: 153–200.
Plato 1997. Sophist. In *Complete Works*, ed. J. M. Cooper, 235-293. Indianapolis: Hackett.
Price, H. 1990. Why 'Not'? *Mind* 99: 221–238.
Price, H. 2019. 'Not' Again. Accessed 04/02/2019. http://prce.hu/w/preprints/NotAgain.pdf
Restall, G. 2005. Multiple conclusions. In *Logic, Methodology and Philosophy of Science: Proceedings of the Twelfth International Congress*, eds. P. Hájek, L. Valdés-Villanueva, and D. Westerståhl, 189–205. London: King's College Publications.
Rumfitt, I. 2000. "Yes" and "No". *Mind* 109: 781–823.
Russell, B. 1919a. On propositions: What they are and how they mean. *Proceedings of the Aristotelian Society. Supplementary Volumes* 2: 1–43.
Russell, B. 1919b. The philosophy of logical atomism. *The Monist* 29: 32–63.
Russell, B. 1951. Obituary: Ludwig Wittgenstein. *Mind* 60: 297–298.
Taylor, R. 1952. Negative things. *Journal of Philosophy* 49: 433–449.
Taylor, R. 1953. Ayer's analysis of negation. *Philosophical Studies* IV: 49–55.

Tennant, N. 1987. *Anti-Realism and Logic. Truth as Eternal*. Oxford: Oxford University Press.

Tennant, N. (1999). Negation, absurdity and contrariety. In *What is Negation?*, eds. D. Gabbay and H. Wansing, 199–222. Dortrecht: Kluwer.

Tennant, N. 2009. Natural logicism via the logic of orderly pairing. In *Logicism, Intuitionism and Formalism. What has become of them?*, eds. S. Lindström, E. Palmgren, K. Segerberg, and V. Stoltenberg-Hansen, 91–125. Dordrecht: Springer.

Veber, M. 2008. How to derive a 'not' from an 'is': A defense of the incompatibility view of negative truths. *Metaphysica* 9: 79–91.

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BOOK REVIEW

Davor Pećnjak, Tomislav Janović
PREMA DUALIZMU. OGLEDI IZ FILOZOFIJE UMA
(Towards Dualism: Essays in Philosophy of Mind)
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LUCA MALATESTI
University of Rijeka

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In their book Davor Pećnjak and Tomislav Janović address two central issues in philosophy of mind. In chapters 1-5, they investigate the most fundamental properties of mental states and their mutual relationships. In chapter 7-15, they investigate the mind body problem that, notoriously, concerns the relation of the mind with the physical world. Both lines of investigation are carried forward mostly by engaging with current contemporary analytic philosophy of mind. However, when appropriate, they refer to classic continental philosophers, mostly in the phenomenological tradition.

Following a consolidated tradition in philosophy of mind, the Authors consider intentionality and phenomenal character as the fundamental properties of mental states. Intentionality is the property of being about something. Thus, for instance, the belief that the sun is hot is intentional insofar it is about the fact that the sun is hot. Usually, it is said that the belief has the *content* that the sun is hot. Pećnjak and Janović, referring to the work of Christopher Peacocke, that is primarily inspired by that of Gareth Evans, recognise the existence of mental states with non-conceptual content (Chapter 4). So, they might be saying that the dog is smelling a toast burning, without having to assume that the ascribed representation, that is, this specific way of representing an event, requires that the dog has the concept of toast or that of burning.

The Authors characterise phenomenal character as what it is like to have a certain conscious mental state. Thus, for instance, when we are having a conscious experience of a colour, there is a specific way that characterises our having that experience of colour.

In particular, the Authors maintain that phenomenal character characterises

a fundamental dimension of mental states that cannot be reduced or explained in terms of mechanisms that render accessible a certain internal state to a certain cognitive mechanism.

The rejection of the reducibility of the phenomenal character of mental state to its intentional properties is one of the important claims in Chapter 2. Thus, the Authors oppose representationalism. This is the view that the phenomenal character of an experience is identical or is fixed by its intentional properties. Representationalism has many supporters in contemporary analytic philosophy, including some that would like to naturalise phenomenal character by naturalising intentionality (Michael Tye, Fred Dretske and Gilbert Harman).

The Authors maintain that all mental states have a phenomenal character (Chapter 3). They show that this is the case for beliefs and other propositional attitudes. They refer to epistemic feelings such as those that are supposedly accompanying phenomenal character of intentional mental states. By relying on the phenomenological tradition, they introduce the notion of non-sensory phenomenal character to spell out the phenomenal character that they think is associated with conceptual intentional states.
A central thesis of the book is that a mental state can be intentional only if it has or can potentially have a phenomenal character, and thus it is conscious (Chapter 3). The existence of intentional mental states that cannot have a phenomenal character is denied. This is a quite strong thesis that challenges central assumptions in contemporary cognitive science. In fact, central explanatory strategies in this discipline, as for example in the study of perception, learning, memory and language, refer to the assumption of the existence of sub-personal computational mechanisms that operate on unconscious representations. This explanatory paradigm has also inspired the postulation of non-conscious non-conceptual content that the Authors appears to recognise only in its conscious form.

Their exploration of the relationship of phenomenal character and intentionality covers also the issue whether, as stated by the so-called higher order thought theories of consciousness, what confers to a mental state its phenomenal character, and thus its being conscious, is being the object of a higher order thought (Chapter 5). The principal target of their criticism is the account offered by Peter Carruthers.

Regarding the mind body problem, the book advances a dualism of properties. This ontological view is reached after a criticism of eliminativism, the doctrine that our ordinary conception of mental states and their features will be replaced by mature neuroscience (Chapter 6) and an historical excursion into traditional arguments for dualism (Chapter 7).

Further the Authors offer, and in some cases endorse, several very influential and some less influential contemporary arguments for the dualism of properties. Respectively, Richard Swinburne's arguments based on the metaphysics of properties and events (Chapter 8), the conceivability arguments by Saul Kripke and David Chalmers (Chapter 9), the knowledge argument by Frank Jackson (Chapter 10) and the argument form simplicity by David Barney (Chapter 11). These arguments are aimed at showing that consciousness involves properties that are not physical properties. Given the primacy that the Authors give to consciousness in fixing intentionality, if follows that this latter feature is not physical as well.

In addition, the Authors, by relying on the work of Crawford Elder, elaborate a general ontological view that accommodates their account of the mental in a multi-layered view of reality. In Chapter 13, they oppose the view that all mental processes are computational ones, that, in principle, could be emulated by a computer. Chapter 14 engages with the *mysterianism* of Colin McGinn, who maintains that although consciousness is a natural phenomenon it is impossible for us to understand how this is so. The Authors contend that there is no a good reason why McGinn should couple this latter thesis of cognitive closure with materialism. Instead, they argue that it would combine better with dualism. Although, as stated in the introduction, Tomislav Janović does not endorse substance dualism as Davor Pećnjak does, Chapter 15 offers some arguments to fend off reasonings that highlight the difficulties in the individuation of immaterial substances.

It is impossible to critically engage with a book of such a width that touches upon so many different interrelated topics. I would like just to focus on the Authors' criticism of representationalism. In fact, this appears to a be turning point in the first part of their book. Their further accounts of the relationships between intentionality and phenomenal character depends on this view.

They respond to the argument from the transparency of experience that some representationalists have used to support their view (Harman, Tye). This argument can be taken as involving two steps. First, it is argued that introspective evidence does not show that that our experiences have a phenomenal character, because we are not aware of our experiences. For instance, in seeing a red surface we are not aware of the experience of red, instead we are aware of a surface that appears to be red. Second, what we are aware of is what the experience represents the world as being. For instance, in seeing a red surface we can only be aware of what it represents,

in this case a surface that is red. That is, we can only be directly introspectively aware of the representational content of the experience.
One response by the Authors, that is worth quoting entirely, is the following:

> First, we believe that this type of complaint simply misses the target, i.e. it does not refute what we are trying to show in this chapter. Namely, we do not see how the argument of transparency of experience – which, note well, also relies on the introspective evidence, only interpreted differently – could dispute such a fundamental, most directly available fact that every conscious state, unlike its unconscious version, has a phenomenal or qualitative component, no matter that this phantom entity, at least under normal circumstances, cannot be introspectively identified and analysed as a separate part of the mental state, independent from its intentional content. (Pećnjak and Janović, 2014: 21)[1]

This remark seems to be methodologically unfair to representationalists insofar it is made by the Authors who, in the initial part of the book, declare their allegiance to first-personal methods in the study of the mind. Moreover, in no place they specify the peculiar observational conditions under which phenomenal character can be shown to be separable from intentional content.

However, the Authors offer also positive arguments or indirect evidence to prove the independence of phenomenal character from intentional features of the experience. In one of them, they compare a perception of a house with the mental image of the same house (p. 21). They conclude that the difference between the two experiences, in terms of intensity, clarity, and richness of detail must be in the phenomenal character of the experiences and not in their intentional features (probably, because both are about the same house).

[1] English translation by the author. The original in Croatian is: "Kao prvo, smatramo da ova vrsta prigovora jednostavno promašuje metu, tj. da ne opovrgava ono što nastojimo pokazati u ovom poglavlju. Naime, ne vidimo kako bi se argumentom transparentnosti iskustva - koji se, nota bene, također oslanja na introspektivnu evidenciju, samo drugačije interpretiranu[27] - mogla osporiti tako temeljna, na najizravniji mogući način dostupna činjenica da svako svjesno stanje, za razliku od svoje nesvjesne inačice, ima neku fenomenalnu ili kvalitativnu komponentu, bez obzira što taj fantomski entitet, barem pod uobičajenim uvjetima nije moguće introspektivno identificirati i analizirati kao zaseban dio mentalnog stanja, nezavisan od samog intencionalnog sadržaja." (Pećnjak and Janović, 2014: 21)

It is not clear why such a difference is not about the ways in which the two experiences represent the world as being. Consider that besides the first perception P_1 of the house there is also, after a short time, a second perception P_2 of the same house under the same visual conditions. It seems plausible to say that P_1 and P_2 are representing the house with a similar degree of correctness and that it is greater than that of the mental image. Now, such a representational difference can only derive from the similarity and difference in intensity, clarity and richness of detail of these experiences. Thus, we might conclude that these latter properties are representational features of the experiences.

It cannot be replied to this that intensity, clarity, and richness of details are phenomenal characters that fix the representational properties of the experiences. This, of course, is consistent with the Authors' account of the foundational role of consciousness in intentionality. However, this reply would require exhibiting the further intentional properties of the experience that are so fixed by their phenomenal character. At least introspectively, it seems that no other properties, besides the supposed phenomenal characters that could ground the representational differences and similarities mentioned above, are in sight.

Despite my reservations above, it must be acknowledged that Pećnjak and Janović have written an impressively wide-ranging book that touches upon several central contemporary debates in contemporary philosophy of mind and in relevant areas of metaphysics. They scholarly address these issues and advance clear positions with well-developed arguments. In the first five chapters, where the fundamental features of mental states and their mutual relations are investigated, the book offers a very original discussion and frames in an innovative and intriguing way a significant fragment of a philosophical theory of the mind. The second part, chapters 7-15, relies on an accurate selection of contemporary arguments and the Authors present and discuss them forcefully. One interesting and completely original feature of the book is the use in many places of the predicate logic to analyse the available theoretical positions and the relevant concepts. This confers a great level of clarity and precision to many discussions in the book.

Overall, the most important feature of the book is that, with their opposition to in necessarily non-conscious representations and to the possibility of characterising mental states computationally, the Authors offer an alternative paradigm that challenges a wide range of theories and research programmes in contemporary cognitive sciences. Although the book will not convince everyone that their challenge cannot be met, surely their arguments should not be ignored.

In conclusion, the book offers to any expert in the field of philosophy of mind the possibility of engaging with a well-articulated and far reaching philosophical view on the nature of the mind that is developed by engaging with several streams of contemporary discussion. Advanced philosophy students, who are at least familiar with predicate logic, beside the original position of the Authors, will find in this book a useful point of entry into several important contemporary debates within the analytic philosophy of mind and well-chosen pointers to relevant views also within the phenomenological tradition.

ABSTRACTS (IN CROATIAN)

LOGIČKA KONTINGENTNOST IDENTITETA

HANOCH BEN-YAMI
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SAŽETAK

U radu pokazujem kako intuitivana i logička razmatranja ne opravdavaju uvođenje Leibnizova načela identiteta nerazlučivosti istovjetnih u nešto više od primjene na atomarne formule. Kada ovo prihvatimo, slijedi da Leibnizov zakon generalizira na sve formule predikatne logike, ali ne na formule modalne logike. Uz druge stvari, ispada da je identitet logički kontingentan.

Ključne riječi: Leibnizov zakon, nerazlučivost istovjetnih, identitet, nužnost, kontingencija

JE LI HOBBES DOISTA ANTIREALIST U POGLEDU AKCIDENATA?

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SAŽETAK

U djelu Metaphysical Themes, Robers Pasnau interpretira Thomasa Hobbesa kao antirealista u pogledu svih akcidenata općenito. Suprotno Pasnauovoj tezi, tvrdimo da je Hobbes realist u pogledu nekih akcidenata (npr. pokreta i dimenzije). Prvi odjeljak predstavlja Pasnauov stav o Hobbesu, to jest ideju da je Hobbes nekvalificirani antirealist eliminativističke vrste. Drugi odjeljak pruža razloge za odbacivanje Pasnauove interpretacije. Hobbes objašnjava da je dimenzija neovisna od uma te pruža teoriju percepcije u terminima pokreta (shvaćenog kao svojstvo tijela neovisno od uma). Stoga, čini se neispravno nazivati Hobbesa antirealistom po pitanju svih akcidenata. Treći odjeljak razmatra Pasnauov hipotetski odgovor: mogao bi tvrditi da se za Hobbesa pokret svodi na tijelo te da ne postoji zasebno. Četvrti odjeljak navodi kako redukcionizam po pitanju svih akcidenata ne povlači antirealizam oko svih akcidenata. Čak i ako dopustimo Pasnauov pretpostavljeni odgovor, njegovo antirealističko čitanje ne slijedi. U suprotnosti s Pasnauovom tvrdnjom, Hobbes u najboljem slučaju tvrdi da pokret i dimenzija postoje neovisno od uma.

Ključne riječi: Hobbes, Pasnau, antirealizam o akcidentima, tijelo, pokret

JE LI INKOMPATIBILIZAM KOMPATIBILAN S FREGEIZMOM?

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SAŽETAK

Ovaj rad razmatra je su li inkompatibilizam, stav da se negacija objašnjava kao primitivan pojam inkompatibilnosti i Fregeizam, stav da su aritmetičke istine analitičke istine, prema Fregeovoj definiciji tog pojma u *Osnovama aritmetike*, kompatibilini. Oba stave imaju svoje prednosti, pogotovo nekome tko je empirijski orijentiran. Oba stava pokušavaju objasniti dva filozofski intrigantna fenomena: problem negativne istine, te problem epistemičkog pristupa brojevima. Za inkompatibilista, dokazi numeričkih ne-identiteta moraju se pozivati na primitivne inkompatibilnosti. U radu argumentiram da nema takvih analitičnih primitivnih inkompatibilnosti. Dakle, inkompatibilisti ne mogu biti Fregeovci.

Ključne riječi: analitičnost, aritmetika, neistinitost, inkompatibilnost, negacija

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