

ARTICLE

# Cross-Temporal Necessitation? A Platonist Reply to Leininger

Pieter Thyssen\*

Postdoctoral Researcher, Chargé de Recherches FNRS  
Institut Supérieur de Philosophie, Université Catholique de Louvain  
Place Cardinal Mercier 14, B-1348 Louvain-la-Neuve, Belgium

Webpage: <https://philpeople.org/profiles/pieter-thyssen>

ORCID: <http://orcid.org/0000-0003-3080-6374>

\*pieter.thyssen@uclouvain.be

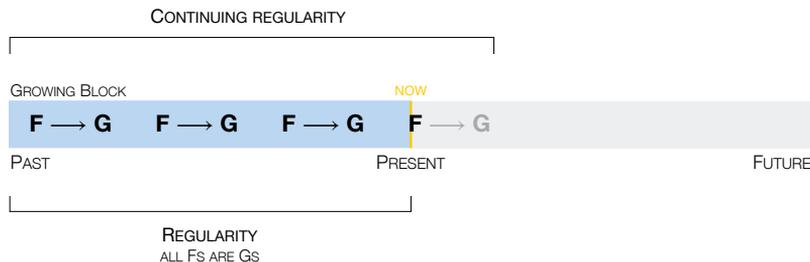
## Abstract

According to Leininger, presentists and growing blockers cannot explain why past and present regularities persist in the future. In order to do so, they would have to appeal to enforcers, such as causation, laws or dispositions. But in a world with no future, these enforcers are powerless and cannot guarantee future regularity. I disagree and argue that Leininger’s coordination problem can be met by distinguishing type- from token-level necessitation. Whereas token-level necessitation is cross-temporal and subject to Leininger’s coordination problem, type-level necessitation is atemporal and immune to the coordination problem. For this solution to work, though, type-level necessitation must be ontologically prior to token-level necessitation. This forces us to adopt a Platonist position according to which universals are transcendent, and not immanent.

**Keywords:** time; temporal becoming, absolute becoming; presentism; growing blockism; coordination problem; cross-temporal relations; necessary connections; causation; laws of nature; dispositions; type/token; Meinongianism; Platonism; universals.

## 1. Introduction

If one considers the different ontologies of time (Figure 1), there are those who *deny* the existence of the future (such as presentists and growing blockers), and those who *accept* the existence of the future (such as eternalists and moving spotlights). Leininger (2021, p. 1) calls the first group **Future Deniers** (or FuDs for short) and claims that they face “a serious metaphysical problem”.



The problem is the following. According to Leininger, **the world is regular**: there are universal generalisations of the form *all Fs are Gs*. What is more, as the future comes into existence, the world *remains* regular: “what comes into existence is *coordinated* with what comes before [such] that these universal generalisations [continue to be] realised” (p. 4). FuDs therefore face a **coordination problem**: how to explain the *continuing* regularity of the world? That is, why do past and present regularities *persist* when the future comes into existence?

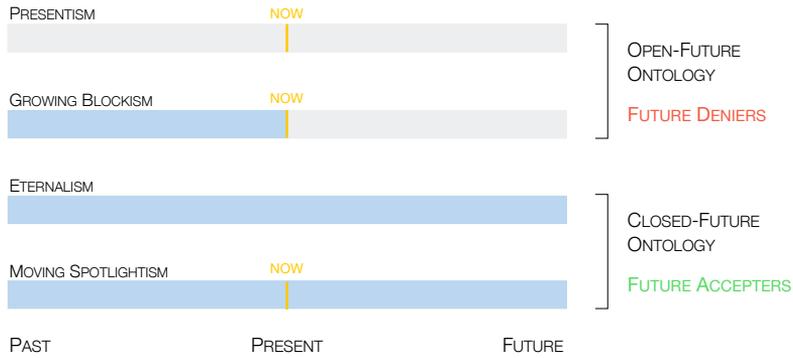
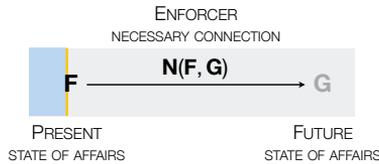


Figure 1. The different ontologies of time.

A standard way of answering the coordination problem for FuDs is by **appealing to enforcers** (causation, laws of nature, dispositions). Enforcers guarantee that whatever comes into existence preserves past and present regularities by introducing a **necessary connection**  $N(F, G)$  between present states of affairs  $F$  and future states of affairs  $G$ , such that if  $F$  presently exists,  $G$  must necessarily follow when the future comes into existence.



But Leininger argues that in a world with no future the **enforcers are powerless** and *cannot* guarantee future regularity. That is,  $N(F, G)$  CANNOT ENSURE THAT  $G$  WILL FOLLOW  $F$ . AFTER ALL, IF  $F$  PRESENTLY EXISTS, THEN  $G$  IS FUTURE AND DOES NOT EXIST FOR FuDs. BUT FOR THE NECESSITY RELATION  $N(F, G)$  TO EXIST, BOTH  $F$  AND  $G$  NEED TO EXIST. HENCE, AS LONG AS  $G$  DOES NOT EXIST,  $N(F, G)$  DOES NOT EXIST, AND  $N(F, G)$  CANNOT BE USED TO NECESSITATE  $G$  INTO EXISTENCE.

According to Leininger, then, an explanation of regularity requires the future to exist. Hence, **FuDs are wrong**: the future does not come into existence; there is no absolute becoming (no ontological shift in which the unreal future becomes real in the present). The future already exists; eternalism is the correct ontology of time.

In this reply, I want to resist Leininger’s conclusion by arguing that FuDs of a non-Humean bent can answer the coordination problem by **distinguishing type- from token-level necessitation**.

## 2. The problem of cross-temporal relations

Although Leininger nowhere makes it explicit, I take her coordination problem to be a new variation of the more general **problem of cross-temporal relations**, which can be stated as follows (see McDaniel 2009, p. 235; Baron 2012, p. 2):

### The Problem of Cross-Temporal Relations for Presentism:

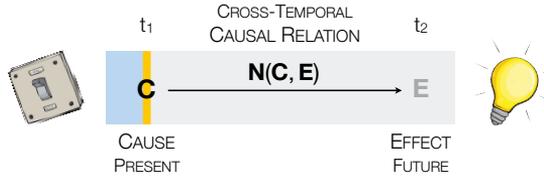
(P1) Relations require the existence of their relata (assumption<sup>1</sup>)

(P2) Some relations are cross-temporal and hold between present and non-present events (assumption)

<sup>1</sup>P1 is the assumption that all relations are existence-entailing: for a relation to hold, its relata must exist.

- (P3) Non-present events exist (from P1, P2) 51
- (P4) If presentism is true, non-present events do not exist (assumption<sup>2</sup>) 52
- Therefore 53
- (C1) Presentism is false (from P3, P4) 54

Given the contradiction between P3 and P4, it is not obvious how the presentist can account for the truth of claims involving cross-temporal relations.<sup>3</sup> What is more, given the pervasiveness and variety of cross-temporal relations, the problem of cross-temporal relations has reared its head in a plethora of ways. 55  
56  
57  
58



One specific variation on the cross-temporal theme is the **problem of causation**. Assuming that causes  $C$  are prior to their effects  $E$ , all causal relations  $N(C, E)$  are cross-temporally exemplified, and are therefore subject to the problem of cross-temporal relations. Here is Leininger’s (2021, p. 8) formulation of the problem: 59  
60  
61  
62  
63

$N$  IS SUPPOSED TO BE A CONNECTION, AND A CONNECTION CANNOT EXIST WITHOUT ITS RELATA. THIS RULES OUT THAT  $N$  COMES INTO EXISTENCE WHEN  $[C]$  COMES INTO EXISTENCE, BECAUSE, AT THAT POINT, ONE OF THE RELATA ( $E$ ) DOES NOT [YET] EXIST. BUT IF  $N$  DOES NOT EXIST WITHOUT  $E$ ,  $N$  CANNOT GUARANTEE  $E$ ’S EXISTENCE.  $[C]$ , THEREFORE, CAN EXIST WITHOUT  $E$  FOLLOWING. 64  
65  
66  
67  
68

### 3. The coordination problem 69

In her paper, Leininger essentially *generalises* the problem of causation to other enforcers, such as laws and dispositions. Her coordination problem is thus another variation on the same cross-temporal theme. Here, then, is my own formulation of the coordination problem: 70  
71  
72

#### The Coordination Problem for FuDs: 73

- (P1) Relations require the existence of their relata (assumption) 74
- (P2) Necessitation relations are cross-temporal and hold between present and future states of affairs (assumption) 75  
76
- (P3) Future states of affairs do exist (from P1, P2) 77
- (P4) If FuDs are right, future states of affairs do not exist (assumption) 78
- Therefore 79
- (C1) FuDs are wrong (from P3, P4) 80

As Leininger (2021, p. 2) herself explains: “ULTIMATELY, THE REGULAR NATURE OF THE WORLD DEMANDS POSTULATION OF A RELATIONSHIP  $[N(F, G)]$  BETWEEN WHAT EXISTS  $[F]$  AND WHAT DOES NOT  $[G]$ , A RELATIONSHIP THAT CANNOT, IN PRINCIPLE, BE SUPPLIED” given the assumption that relations are existence-entailing. 81  
82  
83  
84

Since FuDs will want to retain P4, they must respond to the coordination problem by rejecting either P1 or P2. The first strategy consists in **denying that cross-temporal relations are existence-** 85  
86

<sup>2</sup>Indeed, according to the presentist credo, necessarily, everything that exists, is present.

<sup>3</sup>Often-cited examples of such relations are precedence relations (“Newton’s birth is earlier than Einstein’s”), comparative relations (“I am bigger (now) than Einstein (was)”) and causal relations (“Yesterday’s storm caused today’s flood”).

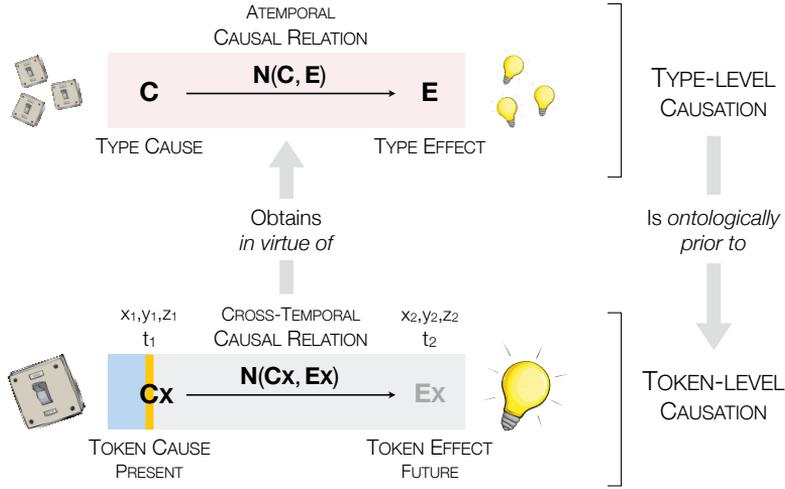


Figure 2. Type- and token-level causal necessitation.

**entailing.** According to Ingram and Tallant (2022), “presentists who go this route deny ‘serious presentism’ and start down the road towards **Meinongianism**, a position which many find quite undesirable.” As such, I will not entertain this strategy here.

The second strategy consists in **denying that necessitation relations are cross-temporal in nature**. *Prima facie*, this strategy may not seem much more promising. After all, in order to ensure that past and present regularities *persist* in the future, it seems that the necessary connections have to be cross-temporal, linking present states of affairs with future ones. Yet, I believe there is a way of avoiding the cross-temporal threat by distinguishing between two kinds of necessitation: **type-level and token-level necessitation**. In what follows, I apply this distinction to *causal, nomic, and metaphysical necessitation*.

#### 4. Causal necessitation

The key to solving Leininger’s causal coordination problem, I maintain, is the distinction between **two kinds of causation** which occur at two different ontological ‘levels’ (Figure 2):

- (1) *token-level causation*, such as  $Cx \rightarrow Ex$  (where the causal relation holds between a token cause  $Cx$  and a token effect  $Ex$ , e.g. “flicking the light switch in my kitchen causes the kitchen light to go on”);
- (2) *type-level causation*, such as  $C \rightarrow E$  (where the causal relation holds between a type cause  $C$  and a type effect  $E$ , e.g. “flicking light switches causes lights to go on”).

**Token causes and effects are particular events** which are located in space and time. Assuming that causes are temporally prior to their effects, token-level causal relations are cross-temporal, linking a present cause to a future effect.

**Type causes and effects, in contrast, are kinds of events.** Since kinds of events can have multiple instances, they cannot be located in space and time. Type-level causal relations therefore fail to be spatiotemporal and can best be thought of as *atemporal* in nature.

**Type- and token-level causation are not independent.** Which kind of causation is ontologically prior to the other, though, is open for debate. But in order to answer the problem of cross-

temporality, we need to assume that type-level causation is more fundamental than token-level causation. That is, we need to argue that the presence of a causal relation between token events  $Cx$  and  $Ex$  obtains *in virtue of* a more general connection between event types  $C$  and  $E$  (of which  $Cx$  and  $Ex$  are tokens):  $Cx \longrightarrow Ex$  **in virtue of**  $C \longrightarrow E$ .

How does this distinction allow us to answer Leininger's coordination problem? In all of the above formulations of the coordination problem (see text in SMALL CAPS in §§1–3), Leininger does not distinguish type- from token-level causation. She thus writes  $C$  and  $E$ , rather than  $Cx$  and  $Ex$ , for *token* causes and effects, and thereby wrongly assumes that they populate the same ontological level as  $N(C, E)$ . Hence, Leininger erroneously maintains that  $N(C, E)$  cannot exist as long as  $Cx$  and  $Ex$  ( $C$  and  $E$  in her notation) do not exist.

But  $N(C, E)$  is a relation at the *type*-level, linking *type* causes to *type* effects. And on the assumption that *type*-level causation is ontologically prior to *token*-level causation, the causal necessity relation  $N(C, E)$  **holds atemporally**, independently of any spatiotemporal instantiation of this relation at the token level. As such,  $N(C, E)$  can be invoked to explain why  $Ex$  must follow  $Cx$ , even though  $Ex$  does not (yet) exist.

The cross-temporal problem, in other words, can be avoided by invoking an atemporal necessitation relation at the *type*-level to bring its cross-temporal instantiations at the *token*-level into existence:  $Cx \longrightarrow Ex$  **in virtue of**  $C \longrightarrow E$ .

## 5. Nomic necessitation

A similar strategy can be used with respect to nomic necessitation. The standard governing account of laws was independently proposed by Dretske, Tooley and Armstrong, and is often referred to as the **DTA account**.

According to DTA, a regularity of the form “*All Fs are Gs*” is a law of nature *iff* (1)  $F$  and  $G$  are universals, and (2) a **nomic necessitation** relation  $N$  holds between  $F$  and  $G$ . This state of affairs is symbolised as  $N(F, G)$ . For example, “*All humans are mortal*” is a law because (1) being human ( $F$ ) and being mortal ( $G$ ) are universals, and (2) a nomic necessitation relation  $N$  holds between  $F$  and  $G$ . According to DTA then, whenever a particular object  $x$  instantiates the property  $F$ , the instantiation of  $F$  ( $Fx$ ) guarantees, via  $N$ , that the property  $G$  will also be instantiated ( $Gx$ ).

Importantly, whereas  $Fx$  and  $Gx$  are **tokens** (particular states of affairs, *i.e.*, particular instances of universals) which are located in space and time,  $F$  and  $G$  are **types** (types of states of affairs, *i.e.*, universals) which can be multiply instantiated and therefore lack a determinate spatiotemporal location.

Since the relation of nomic necessitation  $N$  links the universals  $F$  and  $G$ , rather than  $Fx$  and  $Gx$ ,  $N$  itself fails to be cross-temporal. The different instantiations of  $N(F, G)$ , however, are cross-temporal. Armstrong, for example, takes them to be cases of **singular causation** where  $Fx$  at one time is causally connected to  $Gx$  at a later time.

What is more, by postulating a nomic necessitation relation  $N(F, G)$  on the type-level (as opposed to the token-level), DTA suggest that the type-level is more fundamental than the token-level. Indeed, according to DTA,  $Fx$  cross-temporally necessitates  $Gx$  on the token-level *in virtue of*  $F$  atemporally necessitating  $G$  on the type-level:  $Fx \longrightarrow Gx$  **in virtue of**  $F \longrightarrow G$ . So, just as with causal necessitation, the cross-temporal problem can be avoided by carefully distinguishing *type*- from *token-level* relations of nomic necessitation.

## 6. A plea for Platonism

155

One final problem looms when we consider Armstrong’s specific developments of DTA. Part of Armstrong’s metaphysic is the Aristotelian claim that **universals are immanent** (i.e. states of affairs are ontologically prior to universals). This can be contrasted with the Platonic claim that **universals are transcendent** (i.e. universals are ontologically prior to states of affairs).

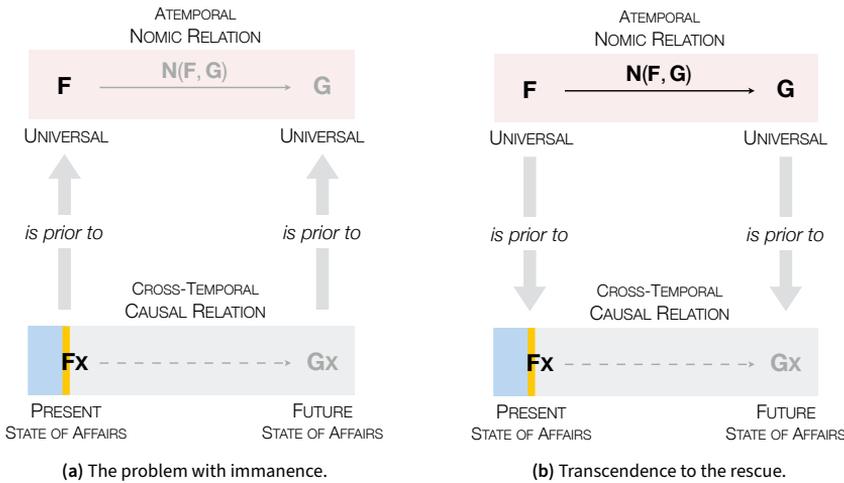
156  
157  
158  
159

Armstrong’s immanence thesis entails the *Principle of Instantiation* which says that **there are no uninstantiated universals**. So for universal  $F$  ( $G$ ) to exist, there needs to be at least one instance of  $F$  ( $G$ ), that is, one state of affairs  $Fx$  ( $Gx$ ). “A property must be a property of some *real* particular; a relation must hold between *real* particulars”, says Armstrong (1983, p. 75).

160  
161  
162  
163

Armstrong’s immanence thesis, however, is incompatible with my solution to the nomic coordination problem. Here is why. Imagine  $Fx$  presently exists. By the *Principle of Instantiation*, the universal  $F$  exists. The question is: why does  $Gx$  invariably follow  $Fx$ ? Invoking  $N(F, G)$  seems problematic, because  $Gx$  does not (yet) exist, and so the universal  $G$  does not (yet) exist. If  $G$  does not exist, then  $N(F, G)$  does not exist, and so  $N(F, G)$  cannot be used to explain why  $Gx$  must follow  $Fx$ .

164  
165  
166  
167  
168



If, however, we adopt the Platonist position according to which **universals are transcendent**, then  $F$  and  $G$  can exist in “Platonic heaven” regardless of whether or not they are instantiated in the real world. Hence,  $N(F, G)$  exists, and can be invoked to explain why  $Gx$  must follow  $Fx$ , thereby answering Leininger’s coordination problem.

169  
170  
171  
172

## 7. Metaphysical necessitation

173

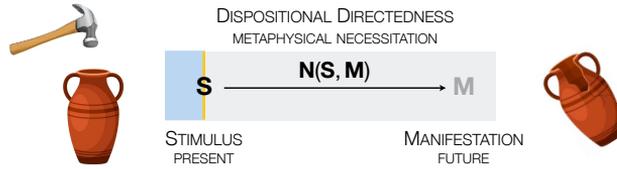
One last way of guaranteeing the continuing regularity of the world is by invoking **dispositions**. Dispositions are often characterised in terms of their causal behaviour: an object is said to have the disposition  $D$  to display a certain manifestation  $M$  when triggered by the stimulus  $S$ . A fragile vase, for example, is disposed to break when struck.

174  
175  
176  
177

The connection between the disposition’s trigger  $S$  and its manifestation  $M$  is often taken to be one of **metaphysical necessitation**, such that if an object has the disposition  $D$ , then necessarily, the object must manifest  $M$  when triggered  $S$ . In shorthand,  $N(S, M)$ . It is this necessary connection, or dispositional directedness as Tugby (2022, p. 41) calls it, between  $S$  and  $M$  that explains why  $M$  will always follow  $S$ , and why past and present regularities will continue to obtain in the future.

178  
179  
180  
181  
182

The problem, once again, is that if  $S$  happens presently,  $M$  will happen in the future. As such,  $M$  does not (yet) exist for FuDs. And on the assumption that relations are existence-entailing,  $N(S, M)$  will not (yet) exist, and so  $N$  cannot be used to explain why  $M$  will follow  $S$  in the future.



The solution, as with causal and nomic necessitation, rests on the fact that  $N(S, M)$  is *not* a cross-temporal relation on the token-level, but an atemporal relation on the type-level. It is a second-order relation between the universals  $S$  and  $M$  which ensures that, once instantiated on the token-level,  $Mx$  will always follow  $Sx$ , even if  $Mx$  does not (yet) exist:  $Sx \rightarrow Mx$  in virtue of  $S \rightarrow M$ .

However, just as with the nomic necessitation case, the metaphysical necessitation relation  $N(S, M)$  can only exist if both universals  $S$  and  $M$  exist. This, once again, forces us to adopt a Platonic (transcendent) view of universals, according to which  $S$  and  $M$  can exist without ever being instantiated in the real world.

## 8. Armstrong's Meinongian problem

A very similar kind of argument was recently proposed by Tugby to argue for a Platonic ontology of properties. Tugby (2022, p. 43) begins by noting that “a particular can have a disposition even if it never manifests that disposition.” A vase, for example, can be fragile even if it never breaks because no one ever strikes it. An object's disposition, in other words, may be dormant and its manifestation non-occurrent. Tugby calls this the **Central Principle**.

According to Tugby, this fact leads to the **paradox of unmanifested dispositions**. Dispositions, after all, are characterised in terms of their directedness towards certain manifestations. As Tugby explains (pp. 46–47), “an obvious way to account for the connection between a disposition and its manifestation, is to appeal to a relation of some sort. [...] The problem, however, is that as soon as the Central Principle is acknowledged, [...] one will be left with cases in which that relation has only one relatum.”

Tugby is not the first to notice this problem. Armstrong (1997, p. 70) already referred to it as the **Meinongian problem**: “When a particular has an unmanifested power, then the particular cannot be related to the potential manifestation of this power because the instantiation of a relation demands that all its terms exist.” He continues (p. 79): “We have here a Meinongian metaphysics, in which actual things are in some way related to non-existent things.”

The solution, not surprisingly, is to adopt a **Platonic ontology of properties**. As Tugby (2022, pp. 41–42) explains: “A Platonic metaphysics of properties can help us to resolve [the] paradox [...]: objects have dispositions in virtue of the fact that they instantiate universals which stand in relationships of dispositional directedness with other universals. These other universals exist even if they are not instantiated. Thus, the directedness [...] of unmanifested dispositions is secured [...] and allows us to avoid a mysterious Meinongian picture of dispositions.”

Notice, finally, that in Armstrong's Meinongian problem, the manifestation  $M$  does not exist because  $M$  is *never* instantiated—neither in the past, present or future. In Leininger's coordination problem, in contrast,  $M$  does not exist because  $M$  is instantiated *in the future*. In a sense, then, Leininger's coordination problem is just the (cross-)temporal version of Armstrong's Meinongian problem, and my solution the temporal equivalent of Tugby's.

## 9. Conclusions

223

I have argued that FuDs of a non-Humean bent can answer the coordination problem by distinguishing between type- and token-level necessitation. For this to work, the type-level has to be ontologically prior to the token-level. With respect to the governing account of laws, or a dispositionalist metaphysic, this forces us to adopt a Platonist position according to which universals are transcendent, and not immanent.

224  
225  
226  
227  
228

## Acknowledgement

229

I owe a great debt to Lisa Leininger for her time and careful remarks on an earlier version of this paper. I also wish to thank the participants of the 7th Annual Conference of the *Society for the Metaphysics of Science* (Bristol, UK, September 6–8, 2022) for stimulating discussions, which greatly improved this paper. Finally, thanks to the *Philosophy of the Sciences Group* at the University of Buenos Aires (Argentina) and the *Center for the Philosophy of Science and Society* at the Université Catholique de Louvain (Belgium) for useful comments during previous talks.

230  
231  
232  
233  
234  
235

## Funding statement

236

I gratefully acknowledge the Fund for Scientific Research (F.R.S.–FNRS) for funding this postdoctoral project (grant number 40005996).

237  
238

## References

239

- Armstrong, D. (1983). *What Is a Law of Nature?* Cambridge: Cambridge University Press. 240  
 – (1997). *A World of States of Affairs*. Cambridge: Cambridge University Press. 241  
 Baron, S. (2012). “Presentism and Causation Revisited”. In: *Philosophical Papers* 41.1, pp. 1–21. 242  
 Ingram, D. and J. Tallant (2022). “Presentism”. In: *The Stanford Encyclopaedia of Philosophy*. 243  
 Leininger, L. (2021). “Coordination and Coming to Be”. In: *Australasian Journal of Philosophy* 101.1, pp. 213–227. 244  
 McDaniel, B. (2009). “Presentism and Absence Causation: An Exercise in Mimicry”. In: *Australasian Journal of Philosophy* 88.2, pp. 323–332. 245  
 Tugby, M. (2022). *Putting Properties First: A Platonic Metaphysics for Natural Modality*. Oxford: Oxford University Press. 246  
 247  
 248