



Non-standard approaches to emergence: introduction to the special issue

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According to one narrative about the history of the concept of *emergence* in metaphysics and philosophy of science, when British emergentists initially appealed to emergence in the early twentieth century, they aimed to lay the groundwork for a philosophy of nature that was supposed to constitute a middle course between two antagonistic worldviews: *reductive physicalism* and *non-physicalist dualism*. While reductive physicalism aims to establish that all concrete goings-on, ranging from social phenomena to biological and chemical processes, are reducible to fundamental physical states and processes explicated by, and invoked in, an ideal physics, non-physicalist dualism holds that some phenomena resist any kind of physical reducibility, and are radically autonomous *vis-à-vis* physical goings-on. The emergentist idea is that a more plausible way of making sense of the natural world is through accepting that some phenomena resist physical reduction, but that is not to say that such phenomena “float free” of the physical. Such phenomena are taken to be “emergent”, suggesting that there is an emergence *relation* between the emergent entities and their so-called physical “emergence bases”.

Emergence has been construed from the very beginning as a conjunction of two demands. According to what we might call “the dependence demand”, emergent entities are thought to somehow depend on their bases for their existence. Much of what has come after the introduction of the idea of emergence has addressed how to best understand the nature of the dependence relation in question. Is it a supervenience relation? If so, what kind of a supervenience relation is it? What are its formal features? What are its *relata*? With what modal strength is it meant to hold? If it is not a supervenience relation, what is it? Is it a form of causation? Does it hold synchronously or diachronically? Or is it a *sui generis* kind of relation, which we might simply call “emergence” and say no more about? Clearly, the dependence demand, in whatever way it is meant to be spelt

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out, is inconsistent with the radically non-physicalist dualist view that some phenomena float free of the physical. According to what we might call “the distinctness demand”, emergent entities are considered to be distinct from their bases. As with the issue of how to understand dependence, distinctness is also understood in different ways. Is it merely a failure of identity? Or is it a somewhat stronger distinctness relation, e.g. modal distinctness? Clearly, the distinctness demand requires a departure from the reductive physicalist hope that all concrete phenomena are reducible to physical phenomena.

Although emergentism initially intended to resolve the conflict between physicalism and dualism, interestingly, an avatar of this conflict inexorably remains within emergentism itself. Far from occupying the originally targeted mediating middle course, contemporary emergentism is indeed fragmented in a strongly polarized variety of emergentisms. Some emergentist views give the upper hand to dependence at the expense of distinctness (hence coming close to physicalism), while others favor distinctness over dependence (hence verging rather on dualism). Such a polarization has been recently codified into the existence of two mutually exclusive schemas for emergence, into which every possible form of emergentism has been claimed to fit: namely (physicalist-friendly) “weak emergence” and (non-physicalist-friendly) “strong emergence” (Wilson, 2015; O’Connor 2020).

Between both these schemas it seems that no conciliatory middle course is to be found. This led some philosophers to adopt a deflationary stance with respect to the initial pretense of emergentism: in no way could one ever coherently “have the cake and eat it too” (Kim, 2005; Taylor, 2015; for responses that are available to emergentists, see Baysan & Wilson, 2017).

Yet, recent and independent developments, driven by distinct core motivations (e.g. of a historical, metaphysical or empirical nature), have concomitantly participated in mitigating this somewhat pessimistic overview of the state of play. Despite their surface differences, all these endeavors happen to converge on a common attitude. All in their own way, they cast doubt upon (at least) one of the core implicit assumptions of “traditional” (weak or strong) emergentism, leading them to aim at fulfilling the initial emergentist promise of rendering physicalism hospitable to a genuine ontological diversity in *non-standard* way.

These new approaches to emergence can be classified into the following three (not necessarily exclusive) families of non-standard approaches to emergence, according to the traditional background assumption that they are willing to discard:

- (i) *Diachronic emergence* (against the canonical requirement that emergence ought to be exclusively construed as a relation holding between *relata* that are instantiated simultaneously) (Rueger, 2000; O’Connor & Wong 2005; Boogerd et al. 2005; Ganeri, 2011; Santos, 2015; Anjum & Mumford, 2017).
- (ii) *Flat emergence* (against the canonical requirement that emergence ought to be exclusively construed as a hierarchical relation, such that its *relata* should belong to different “levels”) (Guay & Sartenaer, 2016, 2018; Humphreys, 1997, 2016; Sartenaer, 2018).

- (iii) *Epiphenomenal emergence* (against the canonical requirement that emergence ought to be exclusively construed as a relation involving causal/determinative novelty) (Baysan, 2020).

For this special issue, we wanted to prompt our authors to consider questions that are relevant to the emergence debate with an eye to accommodating some of the aforementioned non-standard approaches to emergence. While the articles by Karen Crowther, Samuel Fletcher, Paul Humphreys, Gil Santos, Ludger Van Dijk and Kenneth Silver explicitly focus on what we have called non-standard approaches to emergence, Michele Paolini Paoletti's article goes beyond and offers a metaphysics of structural properties that appeal to some tenets of traditional emergentist thought.

Crowther's article ("As Below, So Before: 'Synchronic' and 'Diachronic' Conceptions of Spacetime Emergence") focuses on the contrast between flat and hierarchical emergence. She explores ways in which these "permissive and general" conceptions of emergence may have some application, when properly amended, in this very speculative scientific endeavor that is quantum gravity, where the putative emergence at stake is the one of space–time itself. On a related theme, Fletcher ("Similarity Structure and Diachronic Emergence") focuses on what we have called diachronic emergence. He offers a formally precise account of this relation using the notion of *similarity structure* as a way of making sense of the typically ambiguous notion of novelty in emergence. His account has the interesting feature of unifying synchronic and diachronic emergence, and is argued to support the claim, often made in the context of quantum gravity, that time itself is emergent. In his article ("Transformational Emergence and Anti-Atomism"), Humphreys also focuses on a diachronic account of emergence, which he refers to, in line with his previous work (e.g. Humphreys, 2016) as "transformational emergence". He proposes that such an account, equipped with a dispositionalist approach to fundamental properties, can explain the possibility for the laws to change over time (a possibility that is also investigated, in a wider context, in Sartenaer et al., 2021). In his article ("Integrated-Structure Emergence and Its Mechanistic Explanation"), Santos proposes a relational ontological view of part-whole emergence against the individualist essentialism of atomistic metaphysics. On his proposed view, a system's attributes can be said to be emergent if they are attributes of a specific macro-structured network of certain transformative and interdependent relations between the parts of that system. Van Dijk's article ("Temporalizing ontology: A case for Pragmatic Emergence") examines the assumption of ontological determinism which is widely shared across varieties of emergentism. He argues that the so-called non-standard approaches to emergence still have this assumption. Drawing upon inspirations from John Dewey's work, he offers an account of flat and diachronic emergence which dispenses with it. In his paper ("Emergence within Social Systems"), Kenneth Silver proposes to fill a gap in the current discussions by developing an account of emergence in a context where it has been seldom fully articulated, namely in social ontology. By focusing on the properties instantiated by the elements of certain systems in such a context, such a « being a five-dollar bill » or a « pawn-movement », he offers a suggestion as to how emergence might occur in a way that is both diachronic—though not exactly in the sense portrayed in this introduction—and consistent with strong emergence

and downward causation. Finally, Paolini Paoletti's article ("Emergence and Structural Properties") proposes a theory of structural properties in which strong, ontological emergence plays a prominent role. A structural property of a complex entity is a property that, when it is had by that entity, constitutively involves that its components have certain other properties and (in most cases) stand in certain structural relations. Appealing to ontological emergence, Paolini Paoletti offers solutions to various problems that a metaphysics of structural properties commonly faces.

We are hopeful that future work on emergence will benefit from these articles addressing the special issue's theme in distinctive ways. Let's also hope that, contrary to what the canonical state of the art may imply (e.g. O'Connor 2020), non-standard approaches to emergence will attract the philosophical scrutiny that we think they deserve.¹

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