

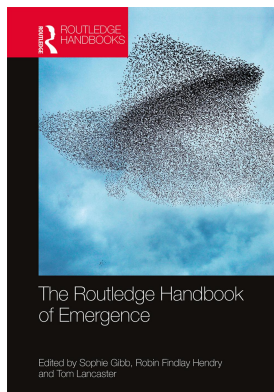
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EMERGENT MENTAL CAUSATION

David Robb

1. Introduction

The twentieth-century neuroscientist Roger Sperry characterized emergent mental causation like this:

[C]onscious phenomena as emergent functional properties of brain processing exert an active control role as causal determinants in shaping the flow patterns of cerebral excitation. Once generated from neural events, the higher order mental patterns and programs have their own subjective qualities and progress, operate and interact by their own causal laws and principles which are different from and cannot be reduced to those of neurophysiology. . . . The mental entities transcend the physiological just as the physiological transcends the molecular, the molecular, the atomic and subatomic, etc. The mental forces do not violate, disturb or intervene in neuronal activity but they do supervene.

(Sperry 1980, 201)

As described in this passage, mental causation is novel, dependent, harmonious, and unexceptional. (1) Novel: Mental phenomena “transcend the physiological” and manifest distinctive “causal laws and principles” at the psychological level. This results in an “active control role” over neural processes, a point I’ll often put – even if Sperry would not – by saying emergent mental phenomena have novel *causal powers*, powers that cannot be found among (or reduced to) powers at these lower levels. (2) Dependent: Mental phenomena, while novel, nevertheless depend or “supervene” on the lower-level processes from which they emerge. (3) Harmonious: Emergent mental causation does not disturb or intervene in lower-level causal processes. (4) Unexceptional: Emergent mental causation is one instance of a phenomenon found at many levels of nature, perhaps all levels except (if there is such) the most basic.

One immediate question is whether these four features are consistent. For example, it’s difficult to see how the mind’s new causal powers could exist harmoniously with those at the lower levels. How could there be mental powers with “active control” over neural processes but that do not “violate, disturb or intervene in” those same processes? We might also ask whether novelty fits with dependence: mental phenomena as described here causally influence the lower-level

processes from which they emerge, an apparently vicious causal circle (Kim 1999). Moreover, at least on some conceptions of dependence, any supervening mental powers must be found in the lower levels, contradicting novelty (Wilson 2011). Not surprisingly, then, much of the literature on emergent mental causation – as well as on emergence generally – has focused on whether a “strong” form of emergence is even coherent (e.g., O’Connor and Wong 2005). I will discuss some of these internal issues later, but given the narrow aims of this chapter, it will be useful to focus not so much on the viability of emergence generally, but on the prospects for emergent *mental* causation. Throughout, Sperry’s characterization will provide a useful, if defeasible, framework for discussion.

2. The autonomy of psychology

One argument for emergent mental causation starts with the frequently cited claim that psychology is an autonomous discipline. Autonomy has been a standard assumption in the study of the mind since the rise of cognitive science in the second half of the last century (Bermúdez 2014, ch. 4). Psychology is autonomous in the sense that it has distinctive kinds, laws, and styles of explanation. While mental kinds – such as belief, memory, and intention – are “realized” or “implemented” in us by biochemical states of the central nervous system, psychology abstracts away from these details to find broader, higher-level patterns (laws) that would not be visible to natural scientists working at lower levels of detail. Such patterns have turned out to be remarkably successful in explaining and predicting human behavior (Dennett 1987; Baker 1987; Antony 2007).

The autonomy of psychology has been challenged from a number of directions, but here we are more interested in how it might secure emergent mental causation. And indeed, all of Sperry’s requirements seem to follow straight away.

First, autonomous psychological kinds, and their causal powers, are novel. By abstracting away from details of implementation, psychologists pick up on similarities – couched in terms of meaning, goals, and the like – that would not be considered salient or natural at the lower levels. Consider, for example, all those who believe in a liberal conception of justice. Psychologically, they have something in common, a similarity that would, in specified circumstances, cause them to act in much the same ways. Psychologists could formulate laws to capture these similarities. But a neuroscientist or physicist examining our subjects is unlikely to find such patterns, claiming that what the psychologist calls a “shared belief” is a unnatural, gerrymandered state in each person, one that moreover shows no interesting common effects across the population. In this sense, autonomous psychological states, and their causal powers, appear novel.

Second, autonomy is compatible with psychophysical dependence. Indeed, proponents of autonomy usually insist on it, often putting the point in terms of supervenience: whenever a subject is in a psychological state Ψ , that person is in some physical state Φ such that necessarily, anything in Φ is in Ψ . Novelty is preserved, as there is no hope of identifying Ψ with any candidate Φ . Any such physical state in an individual merely realizes (implements) the psychological state, and physical realizations can vary dramatically among individuals – this is the “multiple realizability” of the mental (Putnam 1980).

Third, while the psychologist picks up on novel causal patterns, these patterns are, like psychological states themselves, always implemented in lower-level causal mechanisms (Fodor 1974, 1989), resulting in the harmony required by Sperry’s emergentism. Earlier I suggested that novelty may be incompatible with harmony, but the two appear compatible so long as the *way* psychological states shape neural processes (and thus produce behavior) is via their own neural realizers. That is, the causal powers of the mental work in harmony with the powers of the neural,

because the former are implemented in the latter. Thus, if I volunteer for a political party because I hold a liberal conception of justice, my belief causes my behavior by virtue of my belief's realizing physical state causing that behavior. (The physical state may achieve this indirectly by causing the series of movements that realize the behavior.)

Fourth and finally, we should expect that the kind of autonomy claimed for psychology should be found at multiple levels, both above and below the psychological. There are many "special sciences" which abstract from basic physics; they include, among others, neuroscience, economics, and geology. While emergence may not be as ubiquitous as Sperry imagines – it's not clear, for example, that chemistry is emergent – it is not confined to the psychological and is found in many disciplines, resulting in an important sense in which emergent mental causation is not exceptional.

Here then is a model of emergent mental causation, one grounded in the widely accepted thesis of psychological autonomy and exhibiting all of Sperry's core features. However, there is a problem here, one that comes from the attempt to reconcile novelty and harmony. Far from saving the causal powers of mentality, our harmonious picture may deprive it of such powers, at least if these are to be new powers to downwardly shape neural processes and thereby produce behavior. The problem is this: I noted earlier that when an emergent mental state causes some lower-level effect, it does so only via the causal powers of its implementing neural state. Any other way, it seems, would involve a disruption of the sort prohibited by Sperry's harmony thesis. But this means that the powers of the mental state are found in its neural base, contrary to the thesis of novelty. We can put this in the form of a dilemma: either emergent mental causation involves powers not found at the lower level, violating harmony, or it involves powers already found there, violating novelty (cp. Kim 1993, ch. 17).

One option at this point is to give up novelty, at least in the strong form requiring downward causal powers. This can preserve much of what's in Sperry's emergentism. But without downward causation, the view loses much of its distinctive theoretical interest. Indeed, this sort of "emergentism" seems hardly distinguishable from its mainstream rival, nonreductive physicalism (Antony 2007). So perhaps the best option for an emergentist is to give up harmony: emergent mental causation alters the otherwise unbroken causal processes at the neural and other lower levels. So characterized, emergentism is clearly an empirical thesis, predicting that the biochemical processes in the central nervous system will show systematic causal disruptions not predicted by the lower-level laws and powers of the natural sciences. Some opponents of emergentism have argued that we already have enough scientific evidence to rule this out (McLaughlin 1992; Bedau 1997; Papineau 2001), but this remains controversial, and in any case, this broader evidence is evaluated by other chapters in this volume. I will thus continue my more limited strategy of looking at features of our mental lives that are encouraging signs of (i.e., *prima facie* evidence for) emergent mental causation. The next topic is the causal role of reasons, and following that, the causal role of consciousness. I conclude in the final section by looking more closely at whether novelty and harmony might be reconciled after all.

3. The space of reasons

We move in the "space of reasons" (Sellars 1956). We think and act for reasons, we justify what we do in terms of reasons, and we can be evaluated as rational or irrational, sensible or silly. Three days a week, a student walks the same winding route around campus, always visiting the same buildings in the same order; moreover, most of the time during this ritual, she walks backwards. What explains this pattern of behavior? She is a tour guide for the admissions department. Her being a tour guide is a reason, a good one, for her to walk this way. No doubt she would provide

such a reason if asked to justify her behavior. And what might have initially seemed strange now makes sense.

For our purposes, the most important feature of the space of reasons is its normativity. Reasons rationally motivate, justify, and make sense of how we act. The student walks backwards because that's what she should do, given the task at hand. Similar points apply to mental actions such as the forming of justified beliefs (cp. Moore 2014). My reasoning that it will rain tomorrow is not just a sequence of thoughts: I conclude that it will rain because I know this is what's sensible to think in light of my evidence. If I were to conclude otherwise, I would be considered unreasonable, and the resulting belief unjustified. We do not always act or think according to the norms of rationality, but we often do, and the assumption that we move in the space of reasons is indispensable to explaining and predicting our behavior.

Why should these commonplace observations push us towards emergentism? First, it appears as if normativity plays a causal role: my student walks backwards *because* this is the sensible thing to do; I conclude that it will rain tomorrow *because* I should infer this in light of my evidence. These seem to be causal claims. But second, there is no such normativity to be found with the biochemical processes operating in our bodies: rationality, justification, and the like “have no echo in physical theory” (Davidson 1980, 231). Neural and other physical processes are mechanical, not in the old-fashioned clockwork sense, but in the sense that they are governed by brute, impersonal laws of nature. When neurons fire, for example, this is not because it's the rational or sensible thing to do. Granted, a scientist may say that some microphysical event is what “ought” to happen or what “makes sense”, but such talk reflects the scientist's expectations, not the physical processes producing the event, which are normatively blind.

If normativity plays a causal role in our lives, such powers must come from a source other than the biochemical level, and this is where emergentism starts to look promising. The desired novelty is built in from the start, as the power of mental phenomena to respond to (and act on) normative constraints cannot be found in the lower levels. Furthermore, we can respect dependence: while the normative cannot be reduced to the lower levels, it is usually assumed – even by philosophers with otherwise different approaches – that the normative supervenes on the descriptive (Nuccetelli and Seay 2012). But in the interests of saving the distinctive causal powers of the mental, let us abandon Sperry's harmony: swayed by reasons, mental phenomena “break into” the otherwise smooth and mechanistic operations of neural processes so that sometimes, affected by these new powers, neurons really do fire because they should, because it's rational that they do so. (Strictly, it may be the resulting behavior, not the processes leading to it, that is the primary object of evaluation. The preceding neural processes would then be “rational” by virtue of their role in producing the behavior.) Our emergentist picture might also require that we reject or modify Sperry's claim that emergent mental causation is unexceptional, for we have so far not permitted any normative properties at the lower levels that could support a thesis of emergence for biological or chemical causation. If there is emergence at these levels, it will have to come from another source.

Our ability to think and act in the space of reasons seems to be what motivates some emergentists about mental causation (e.g., Searle 1992; Hasker 1999; Lowe 2008). But an opposing camp rejects any such picture as entailing an “intolerable intrusion” of the normative into the causally closed physical world (Kim 1993, 208). We should reject emergentism and instead “naturalize” the role of reasons in our lives. But how? Here is one influential line of thought: suppose the mechanical processes in our brains are structured by our evolutionary and learning histories to *match* the appropriate normative relations so that the space of mechanical causes is (approximately) isomorphic to the space of reasons. When it's good or rational that the tour guide walk backwards around campus, there is, if all is working properly, an internal, mechanical stand-in

for this normative fact causing her to do so. On such a picture, the relevant causal powers are at the lower levels, but we nevertheless move within the space of reasons because these powers are arranged to match the normative relations in this space. This is, in broad outline, what deserves to be called the classical naturalist account of mental causation (Crane 2003; Bermúdez 2014, ch. 6); it might also be extended to nonhuman animals (Gallistel 1989) and to artificial minds (Haugeland 1985).

We should expect emergentists to object that in this picture, we merely appear rational, mechanically mimicking a trajectory through the space of reasons but without acting or thinking *for* those reasons. I can't adjudicate this dispute here. As I suggested earlier, it is an empirical matter – to be settled by the natural sciences – whether, when we act for reasons, higher-level events causally disrupt the biochemical processes in our brains and bodies. If no such disruptions are discovered – if the physical world, or at least our part of it, is causally closed – then it looks as if downward mental causation will need to be abandoned. In that case, some form of naturalism, classical or otherwise, will look more attractive, and we will try to find normativity within the world of natural causes (Dretske 1988; Neander 1995; Taylor 2000). Alternatively, and more drastically, we will abandon talk of moving in the “space of reasons” as prescientific and obsolete (Quine 1960; Stich 1983).

4. Consciousness

So far I have not discussed the feature of mentality that plays a starring role in the earlier quotation from Sperry: consciousness. Sperry writes of “conscious phenomena” and the “subjective qualities” emerging from, then shaping, the lower levels. Consciousness seems to have been what motivated many of the early emergentists, such as Broad (1925), and it's at the center of contemporary discussions of emergent mentality (in, e.g., Clayton and Davies 2006). Perhaps McLaughlin – himself no emergentist – is right that consciousness is “the last refuge of an Emergentist” (1992, 91).

Three features of consciousness make it especially attractive as a basis for emergent mental causation. First, its existence is difficult to doubt. We might be skeptical of the earlier evidence presented for emergentism – perhaps psychology is not autonomous, or reasons are not causes – but we cannot doubt that we are conscious. While consciousness may generate some mysteries, its existence is, as Descartes argued, impossible to rationally deny. Rational doubt is generated by a potential gap between how things seem and how they are, but in the case of consciousness, the reality *is* the seeming: consciousness just is the way things seem to us.

Second, there are good reasons, also originating from Descartes, for thinking that consciousness is novel in the sense required by Sperry's strong form of emergentism. Antireductionist arguments about the conscious mind have swayed even philosophers who are otherwise sympathetic to reductionism about other aspects of our mental lives (Chalmers 1996; Kim 2005). These arguments cannot be summarized here, but many of them are based on thought experiments apparently showing that the physical facts do not suffice to fix the phenomenal facts so that the latter are in this sense additions to the physical world (Gertler 2006).

Third, consciousness seems clearly to affect our behavior. I stop working and walk to lunch because I consciously experience hunger. Your conscious “a-ha” moment during a period of deep thought causes you to begin writing the correct solution to an exam problem (Koriat 2000). By consciously imagining how a large chair could be rotated, I can orient it so that it will fit through a door (Arp 2005). The causal role of consciousness may not be as extensive as we ordinarily think (Wegner 2003), but there is plenty of evidence that it affects a wide range of behavior.

These three features of consciousness jointly form powerful evidence for a strong kind of emergent mental causation. While we should, as before, let go of Sperry's harmony thesis, novelty is secured in from the start. And dependence is present as well: while consciousness cannot be reduced to its physical base, it supervenes – via the appropriate psychophysical laws – on goings-on at lower levels. What about Sperry's fourth feature, exceptionality? On the face of it, consciousness is unique to the psychological level, so that if there is emergence at lower levels, such as those of neuroscience or chemistry, or at higher levels, such as those of sociology, politics, or economics, it will have to be grounded in something other than consciousness. That said, there are views – speculative, to be sure, but intriguing nonetheless – on which consciousness is more widespread in nature than common sense would suggest. There are, for example, varieties of panpsychism on which consciousness, or something like it, is found at lower levels (Seager 2016, ch. 14). And some philosophers have explored the possibility of conscious group minds (Schwitzgebel 2015). Evaluating such views would take us far beyond the scope of this chapter, but here it is enough to note that if consciousness brings with it a strong form of emergentism, then downward mental causation could be even more widespread than imagined by Sperry's already ambitious account.

If there is mental causation of the form just sketched, this should, like emergent causation by reasons, be empirically detectable. There should be disruptions in the physiological processes occurring in the human body when, say, a conscious decision is made. If such disruptions are considered unlikely, emergentists have a venerable fall back: deny that consciousness has novel causal powers, or indeed, that it has causal powers at all. This is the epiphenomenalist's position (Jackson 1982; Kim 2005; Seager 2006). Here we keep Sperry's dependence as well as harmony, but unfortunately the resulting “vindication” of emergentism is pyrrhic, as the view loses its most theoretically distinctive feature: the downward causal powers of the mental.

5. Can novelty and harmony be reconciled?

It appears so far that even if there is evidence for a strong form of emergent mental causation, Sperry's criteria cannot simultaneously be fulfilled. While dependence is available on all versions and unexceptionality on some, it is difficult to see how we might secure both novelty and harmony on any of them. Indeed, it seems almost trivial that mental causal powers that are novel in the relevant sense will fail to work harmoniously with the physical powers from which they emerge. An emergentist about mental causation must, it seems, choose one or the other. Choose harmony over novelty, and emergentism is drained of much of its theoretical interest. Choose novelty over harmony, and emergentism makes a bold empirical prediction about the long-term results of human physiology. But this dilemma might not be genuine. I'll conclude this chapter by looking at some ways novelty and harmony might be reconciled after all.

One way to reconcile them is by first distinguishing types of causal powers from tokens (Wilson 2011). I've assumed so far that if the mind's emergent causal powers are novel, they are of novel types, that is, powers of a sort not found in the lower levels. It's for this reason that we would expect disruptions at those levels, thereby violating harmony. But suppose instead that mental causal powers are “novel” only in the sense that they are new tokens of the same types of powers found at lower levels. That is, mental powers duplicate what's in the neurophysiological base, bringing more (token) powers on the scene, but powers of the same kind that were already present. What results is a kind of overdetermination: mentality causes behavior, but in a way that simply matches what the physical base was already doing. Mental interventions in this picture thus appear nondisruptive in accordance with harmony.

However, this attempt to reconcile novelty and harmony faces some problems. First, we should ask whether this brand of emergentism will in fact respect harmony as desired. If mental

causation always involves two sets of duplicate powers producing behavior (or the processes leading to behavior), this may alter the lower levels after all. Here is an empirical conjecture: overdetermining powers, even when type-identical, always leave distinctive marks on their effects, that is, marks not left by just one set of powers. Our present emergentist – wanting to reconcile novelty and harmony – is betting against this principle. Second, it's not clear in any case that mere token novelty will deliver what the emergentist requires. Consider our earlier discussion of the causal role of reasons. There, the point of postulating emergent powers was that there's no trace of normativity at the lower levels. But if mentality merely duplicates the mechanistic powers at these lower levels, mental powers will also fail to be normative. We might say the same about the causal powers emergentists want to attach to consciousness.

An alternative set of strategies comes from E.J. Lowe, an emergentist who has in a number of works tried to reconcile novelty and harmony (see his 1992, 1996, 2003, 2008). Lowe has proposed several models of downward mental causation to achieve the desired harmony; here I consider just one. Let us avoid overdetermination and say that the token powers of the emergent mind are also of new types – that is, types not duplicating those found at the lower, implementing levels. According to Lowe, these mental powers could constrain causal processes at the neurophysiological level without disrupting them. A central analogy here is the spider and its web. As a spider crawls along its web, the structure of the web constrains the spider's movements, yet without breaking into the spider's internal physiology. Similarly, emergent minds could, like the web, constrain neural pathways without violating their internal integrity. When decisions are made in the brain, multiple independent neural pathways converge in a way that would look entirely coincidental were it not for some more global causal influence guiding them to a particular end. Such an influence comes from the mind's novel powers, but someone looking at the internal workings of any given neural pathway would find it unremarkable and fully in accordance with physical law. As a bonus, we also find Sperry's dependence in this picture: just as the spider produces (i.e., spins) the web that constrains its movements, so neurophysiological processes produce mentality, and with it, emergent causal powers.

The spider web analogy is suggestive, but it cannot fully illuminate the metaphysics of mental causation, at least not if such causation is to be novel and harmonious. While the web's causal powers are distinct from those of the spider, and this in sense are new, the web could not constrain the spider's movement without exerting forces (for example, reaction forces) on the spider, thereby affecting the shape and orientation of the spider's legs, not to mention the distribution of energy within the spider's body. This kind of causal influence isn't harmonious in the required sense. (See Lowe 1996, 82–84 for more discussion web analogy and its limitations.)

Whether there are other kinds of constraining, downward causes more friendly to harmony is an open question (Gibb 2010; Paoletti and Orilia 2017). As mentioned earlier, Lowe has other models of emergent mental causation on offer, and it's also worth considering Sperry's own homespun example of downward causation: the way a rolling wheel's macro-features constrain the movement of the wheel's micro-parts (Sperry 1980, 201). In any case, how this issue is resolved is no mere technical difficulty: the nature of emergent mental causation, as well as its empirical viability, rests on it.

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