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Source

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Spontaneous Generations Volume 11, Issue 1 (Spring/Summer 2023)

doi.org/10.4245/spongen.v11i1.22835

<https://spontaneousgenerations.com>

Editorial Offices

Institute for the History and Philosophy of Science and Technology

Room 316 Victoria College, University of Toronto

91 Charles Street West, Toronto, Ontario, Canada

M5S1K7

Founded in 2006, *Spontaneous Generations* is an online academic journal published by the Institute for the History and Philosophy of Science and Technology, University of Toronto. There is no subscription or membership fee. *Spontaneous Generations* provides immediate open access to its content on the principle that making research freely available to the public supports a greater global exchange of knowledge.



Does Agency Come in Levels?

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Abstract

I examine whether the concept of agency is usefully described as manifesting at different levels, or if it is more fruitful to speak of kinds and scales of agency. Using the enactive definition of agency, I explore some of the complexities of different agencies that overlap in human bodies: organic, sensorimotor, and sociolinguistic. I argue against a neat ranking of these kinds in terms of ontological hierarchy or priority, as they are all constitutively unfinished processes of mutually influenced becoming. Similar considerations apply when looking at agency at different scales, from cells to ecosystems. By inviting hierarchical thinking, level-talk runs the risk of levelling down a variety of complex phenomena in the diverse ways agency is manifested in living, ecological, and social systems.

Key Words

Enaction; agency defined; autonomy; varieties of agency; scales; entanglement

In the social and political sciences, agency continues to be a much-debated topic, a well-spring of theories, counter-theories, and abundant criticism. Are humans the agents of their history? Must they submit to forces beyond their control? Is there anything they can control? How is agency eroded and erased through oppression, infinite distraction, and false consciousness? These questions continue to be central, perhaps more so in our time than in the past. One might imagine that if social and political scientists are so interested in debating agency, they would draw copiously from studies of this concept in disciplines such as psychology and biology, yet the sciences that seem best suited to theorize agency have until recently remained silent about it.

It would take some time to fully explicate the reasons for this, so allow me to suggest an underlying cause for them: the phenomena we associate with agency are uncomfortable for these scientific disciplines. They put too much emphasis on the repressed dualisms that permeate biology and the sciences of the mind, dualisms between mind and world, subject and object, individual and community, and matter and form. An agent is paradigmatically an entity that acts in the world. It

does something. Yet we don't attribute agency to just anything that happens. These days, we look for the causes of a cold gale, not the culprit. Yet, when we examine the causes of an act, we find that the agent is among them, so what makes the agent special? To act is to intervene in a situation more or less successfully according to some motivation, reason, or goal. The problem has henceforth been how to naturalize this mentalistic vocabulary in terms of biochemical or neural processes, as has been the overwhelmingly reductionist wont of these disciplines.

Hence, agency has been an embarrassing topic for many biologists, neuroscientists, and psychologists. If the relevant phenomena can be formulated in more convenient categories such as neural function or genetic regulation, then talk of agency is superfluous. If they can't be so transcribed, then perhaps these notions are mystical; good for everyday discourse but ill-conceived for science despite the lingering suspicion that something important is left unexplained. No wonder other disciplines find what the natural sciences say about agency uninspiring to put it generously.

Things have begun to change, both in biology

and in the embodied cognitive sciences. These developments are not independent; they feed upon one another and a history of this two-way influence is still in the making. Promising a potential break with reductionism, agency is now recognized as existing in a variety of forms, domains, and sizes, from bacteria to institutions. This raises the question of what is common to these diverse manifestations. In this essay I will look at the enactive concept of agency and show that it allows us to think of different kinds and different scales of agency, but that talking about *levels of agency*, as is sometimes done, can flatten out this diversity

The enactive approach to life and mind is, in a sense, fundamentally concerned with agency. This perspective saw its initial formulation in the late 1980s in the work of Francisco Varela and colleagues. Varela was a biologist and neuroscientist who, together with Humberto Maturana, developed the theory of autopoiesis, a perspective on life that today is considered one of the roots of the organizational approach in biology.

The argument can be made that Varela's dissatisfaction with the computer metaphor of the mind and the prevalence of functionalism in cognitive science reflects a parallel dissatisfaction with the adaptationist program in evolutionary biology. It is unsurprising then that when he and his colleagues worked on what would become the inaugural text of the enactive approach, *The Embodied Mind* (Varela, Thompson, & Rosch, 1991), two of their key influences were the works of Richard Lewontin, particularly his text on the organism as subject and object of evolution, and Susan Oyama's critique of the (mis)use of information in explanations of biological inheritance and development (Lewontin, 1983; Oyama, 2000).

I will not expound the point here but, in my opinion, the strategic use of these two authors in articulating the enactive approach reflects a sort of analogical transposition of their relationalism. What they had to say about the participation of organisms in affecting their environments in reciprocal causation during development and evolution needed to be translated into cognitive science. For enaction, an agent relates precisely in the same way to its environment; it is not in the business of representing it to infer what to do next via mental calculations nor

is it all the time in a reactive mode, being driven externally. An organism is neither detached from the world, nor operated by it like a puppet. It participates in the processes that constitute its surroundings, it changes and selects its dynamical couplings, in short, it enacts a world of meaningful relations which is constructed together with environmental processes and other agents.

From the start then, we can see that agency is at the core of enaction. This approach has seen many developments since the 1990s, with an accelerated rate of new ideas, debates, publications, and applications in multiple domains of research and practice. One key development of the enactive approach has been to articulate its initial insights into an organizational concept of agency as first proposed in Di Paolo (2005). Agency is defined in operational terms without appealing to circularities. This idea has been applied to a variety of questions, from minimal forms of organic agency to the agency that emerges in sensorimotor organization or in socio-linguistic engagements.

Henceforth, I will focus on what agency is from an enactive perspective and then move on to the question of whether the language of levels of agency is adequate or whether it can lead us astray (spoiler: it leads us astray).

Agency in the Enactive Approach

The point of proposing a definition of agency is that, provided certain conditions are met, the definition becomes a tool. It may be explored in terms of what it entails and the possible interpretations of its terms. It may be improved, extended, or eventually discarded. The point of a definition is not to foreclose discussion but to build some common ground to encourage it. This is an ongoing participatory process reflecting different opinions, backgrounds, and interests. A definition is useful so long as it helps in this process. It may be helpful even if not widely accepted because it can help ascertain the importance of what it leaves out.

With this caveat, let me briefly say something about those certain conditions that must be met for this to happen. Within the enactive approach there is an interest in building theories of life and mind that may be applied to specific problems, say, better ways of understanding visual perception or roadmaps for

interaction technologies that enhance participation. Theory building, in enactive terms, follows a dialectic of proposing operational concepts, such as autopoiesis, autonomy, operational closure, adaptivity, etc., and confronting them with lived experience, for instance, the structure of time consciousness, our care for what goes on in the world around us, our existential dimension, our encounters with illness or trauma, our practical and empirical findings, and so on. A good enactive definition is built abstractly first, following the more formal dialectical moment, but can then only come to life by the concretized sense given to it by the subsequent confrontation with practice and lived experience: this is the practical dialectical moment.

If we talk about agency, there is a need to acknowledge an asymmetry between agents and their environment. If we cannot do this, then anything we predicate of an agent may be predicated of its environment and the distinction becomes empty. Asymmetry arises from the precarious processes of self-individuation. It does not imply a causal separation between bodies and environments. In fact, it is built on the ongoing coupling between them and their mutually determining relations. Worldly processes take place in the constitution of an agent's self-individuation and leave a trace in the agent's history of becoming. It is possible to take these intimate connections seriously, thus avoiding the erection of a conceptual barrier between an agent's body and surroundings, while at the same time recognizing the differences between them. What is already entailed in this attempt is that an agent is not given once and for all but is constitutively an unfinished process of becoming (Di Paolo, 2021).

As a form of non-reductive naturalism, the enactive approach regards the properties of living and cognitive systems as part of a continuum conceptually as well as ontologically (Thompson, 2007) without erasing qualitative differences. Enactive theory proposes a set of minimal conditions for defining agency. A broad constraint on these conditions is epistemic: a definition of agency should be operational, i.e., based on what can be explained about a concrete instance without appealing to historical or contextual knowledge beyond the system itself and its relations. We should be able to apply our definition even in our first encounter with

an unknown form of agency. An operational definition does not rely on ascriptions of agency by an external observer whether based on convenience, convention, or opinion.¹

From an enactive perspective then, the operational conditions for agency are *self-individuation*, *interactional asymmetry*, and *normativity* (Di Paolo et al., 2017). These are proposed as requirements for *minimal agency*.

Self-individuation is the organizational condition stating that the identity of a system is continuously produced by its own operation. In living organisms this is given by their autopoiesis or elaborations of this concept (e.g., Moreno & Mossio, 2015). In more general cases it is given by the idea of autonomy as operational closure under precarious conditions (Varela, 1979; Thompson, 2007; Di Paolo et al., 2017). Briefly, an autonomous system emerges as the result of the operation of a network of constituent processes under precarious conditions. This network is closed in the sense that each constituent process is enabled by other processes in the network (and also possibly by external processes) and in turn it enables other processes in the network (and also possibly external processes). The conditions are precarious both in the sense that the self-individuating entity is not guaranteed to emerge or persist and, additionally, individual constituent processes cannot be realized in the absence of the network.

Because self-individuation involves and necessitates environmental processes, its relation to the latter is not symmetric. Even if influences and dependencies do flow in both directions, self-individuation entails a difference both in the formal aspect of closure and in the material conditions that lead to its persistence. In principle, the environment does not have to be organized in the same manner, and no particular persistence is necessarily at stake. Precarious conditions bring the autonomous system to situations where the risks of disintegration demand a change in the environmental coupling. If the system can adaptively induce such modulations it may temporarily avoid the tendencies towards disintegration. This is the meaning of interactional asymmetry.

As mentioned above, asymmetric modulations are not random; they are, in fact, *regulations* insofar

as they follow some vital condition, sensorimotor norm, or social value. This is the idea of normativity, broadly construed as situated and graded non-indifference. Agents relate to their world in terms of significance, establishing a perspective on it, narrowing down all possible interactions to just a few meaningful ones. Agents are invested in what happens to them; in a broad sense of the word, they care. This is proposed as the definitional property of any minded system: the creation and appreciation of meaning, or *sense-making* (Di Paolo, 2009). Sense-making, in this view, is the core shared aspect of all mental life, before we introduce further distinctions between action, perception, emotion, and cognition.

A minimal agent, then, is a self-individuating system capable of engaging in asymmetric interactions with the environment and following norms that ultimately relate to the viability of its form of existence. Confronting these three requirements with lived phenomena helps us uncover their internal relations. Vital or acquired norms are grounded in the conditions of ongoing and precarious self-individuation, which relies on asymmetric interventions in environmental flows that adaptively tend to equilibrate a way of life and cast the ‘environment’ into a ‘world’ or *Umwelt* for the active agent. The requirements mutually support each other. Moreover, their relations can grow in concreteness. A history of adaptive regulations becomes sedimented into incorporated relations passing from a behavioral domain to a constitutional domain, as in many cases of ‘externalized’ physiology, such as insects that use air bubbles as external ‘lungs’ to breathe underwater (Turner, 2000). In short, it is the synthesis of the three requirements, rather than a list of three separate conditions, that is proposed as the definition of minimal agency.

We may note that agency does not depend on ideas of activity or passivity. Agents may adaptively submit to external changes induced by environmental processes, such as birds that fly by subtly changing their body in relation to wind currents. An agent may not be the source of all relevant regulations, as is often thought, nor is it required to continuously engage in action. Activity and passivity are *aspects* of agency: they describe neither a dichotomy nor even a single spectrum of possibilities. There are multiple dimensions of activity and passivity, desc-

ribing more or less intense forms of agent involvement in action initiation, regulation, and monitoring (Bermejo et al., 2020). For example, I may actively inhibit my habitual reactions so as to let my arm be moved passively during a medical examination.

What is the relation between life and agency in this view? If we assume that in the organic domain the condition of self-individuation is thoroughly described by the concept of autopoiesis, this would seem to leave the possibility open for cases of organisms that are not agents, since they are not required to meet the other two conditions (asymmetry and normativity) to be autopoietic. In fact, this possibility remains purely abstract. Autopoiesis describes the organization of a network of processes that, through their operation, both regenerate the same network and distinguish it topologically as a unity. These are the conditions of self-production and self-distinction respectively. Although much previous literature does not discuss in depth the relation between these conditions, recent work (Di Paolo, 2018) shows they are not independent but dialectically related. An organism must engage with environmental flows of matter, energy, information, and so on, without dissolving into the environment in the process. The only way this contradiction may be overcome under precarious material conditions is to be an agent, in other words to adaptively regulate interactions and select exchanges with the environment such that they contribute to self-production while avoiding a condition where self-distinction is lost. The tension is spread and regulated over time. Material autopoiesis, therefore, entails agency in the enactive sense. Life entails mind.

The definition of minimal agency helps us examine more complex manifestations. If we act according to norms as agents do, it seems strange that these norms should all eventually reduce to biological self-individuation. We engage in acts that are unhealthy (e.g., smoking, high-risk sports). And we care about engagements in our social world, in which we can safely say we act as embodied beings but not in a way that is entirely defined by our status as living organisms (we care, for example, for the legacy we may leave after we’re gone). Minimal agency does not sufficiently articulate these differences.

Thompson and Varela (2001) usefully distinguish between different dimensions of embodiment: organic, sensorimotor, and social. Humans engage in all three distinct kinds of regulation. Considering the conditions for minimal agency, which seem naturally formulated for the organic dimension, we may explore the question of whether they may not be manifested in the other two dimensions as well. The answer is yes. It is conceivable that sensorimotor interactions (involving neural, bodily, and environmental processes) organize into networks of sensorimotor schemes that may become self-individuating and enact asymmetric regulations according to their own norms of viability. The technical details are given in Di Paolo et al. (2017) via an enactive elaboration of Piaget's theory of equilibration. Evidence for this idea is provided by habits, flexible sensorimotor patterns that instantiate relations of mutual structural support and induce changes in bodies and environments that promote the re-enactment of the same patterns. Bundles of habits, to use the Jamesian phrase, can become a self-individuated autonomous system in the domain of sensorimotor processes, regularly inducing asymmetric modulations of the coupling with the environment, modulations that follow norms that correspond to the viability of the sensorimotor network itself. Consider how we skillfully move and orient in familiar spaces, unreflectingly select the right distance to visually focus on an object depending on a myriad of variables and maybe reposition it when we find it somehow dissonant with its surroundings, unpleasing to the eye. We do this even if it serves no biological function.

A similar but more complex story may be told in terms of our participation in networks of social interaction and languaging (Kyselo, 2014; Di Paolo et al., 2018). For instance, as linguistic bodies we engage in ongoing but paradoxical acts of self-individuation by incorporating utterances from others (idioms, vocabulary, accents, styles) and in so doing incarnating other voices, (i.e., other linguistic agencies). Evidently, the phenomena here are indeed much more complex and raise non-trivial question about the relations between becoming a social agent, embodying a socially constituted form of agency, and realizing new forms of agency alongside other agents. These are murky questions, which is why

talking about levels of agency might prove too simplistic.

To close this flash-tour through decades of enactive research, let us make a few brief clarifications. Agency describes a mode of existence, not a property or an aspect of a system (even if *agent-talk* sometimes may sound like this). The approach is not meant to be anthropocentric or even bio-centric (even if admittedly the paradigmatic exemplars of agency are living organisms). An artificial system could conceivably be an agent. As well, the enactive definition of agency does not minimize the roles played by environmental processes, which may be sometimes strongly normative, constraining some possibilities and promoting others (as in the case of behavior settings, e.g., a church, a market, a train station). Even if not acting as agents, processes in the (physical, natural, socioeconomic) environment often participate as powerful operative factors in the actualization and shaping of the activity of agents.

Kinds and Scales of Agency, but Levels?

The requirements for minimal agency comprise the thread connecting the investigation of different kinds of agency. We can see that, for the most part, the three requirements continue to make sense beyond the purely organic domain, where they are rather unambiguous. This sense, if not always straightforward, encourages the search for a coherent relevant story in other domains (as in the case of habits). The methodology may break down at some point and we may be confronted by instances of agency that do not obviously translate into the three aforementioned requirements. Yet, it is difficult to imagine cases where we would feel compelled to use the language of agency non-figuratively without invoking in some sense the notion of a centre of activity (individuation) that engages in some kind of intervention in its current conditions (asymmetry) in pursuit of a desired outcome (normativity).

What is apparent is that even if we accept the enactive requirements only as a temporary guide, we are already confronted with different kinds of agency: organic, sensorimotor, socio-linguistic, maybe others. A question immediately presents itself, 'What's the relation between these kinds?'

Whatever these relations turn out to be (see Chapter 5 in Di Paolo et al., 2018), it seems clear

that these different kinds of agency in the cases considered involve some degree of systemic and material overlap. Whether we conceive of a single body engaged in different dimensions of regulation or whether we conceive of different kinds of embodiment defined by distinct relations and domains of realization – literally different bodies – we must agree that these different manifestations of agency intersect materially and temporally and overlap in fundamental ways.

But other kinds of agency seem to present us with a different topology, one manifested as we vary scales. Thus, it may make some sense to talk about groups of agents as, potentially, manifesting agent-status themselves, examples such as insect colonies, ecosystems, political organizations. Again, one would have to establish the conditions that validate such talk, and I'd be inclined to consider whether the three requirements are met in these cases or not. Such a move may lead to an assimilation of the particular case in question into the enactive conception of agency or to an accommodation of enactive theory to encompass this case.²

The important point is that it is a genuine question to enquire about whether ensembles in which agents participate may give rise to other forms of agency. I think this is what is behind some of the talk about levels of agency, but it may also be tempting to use levels in a sense of primordality. The latter usage is unwarranted.

Let us first look more closely at the entanglement of organic, sensorimotor, and linguistic agency in human beings. As an infant develops, it comes into direct contact with the activities and objects of human labour, it is invited to fully engage with the flow of history in the form of a stream of linguistic utterances, objects of play, diets, clothes, spaces, rhythms, and traditions. These engagements can take the form of paradoxical alienating disruptions, such as when the rather integrated and homogeneous sensorimotor schemes of a two-month-old infant are disequilibrated by a caregiver who wants her to pay more attention to a new toy. And when sensorimotor schemes diversify as a consequence of this intervention, the caregiver will revert to promoting a refocusing of attention (picking up, looking, touching, tasting) into one object and not many (Di Paolo et al., 2017). Such dialectical enga-

gement induces contradictions in development that when overcome bring forth a new set of bodily possibilities.

Similarly, in linguistic interactions an infant's first gestural enactments of indicative activity, charitably interpreted, provoke parents to address more complex utterances at the child, leading to habitual patterns of indicative languaging suited to a particular family context. Exposure to spheres other than the intimate family setting induces alienating tensions and destabilizes the indicative phase because of a less firm common ground. This disruption promotes the development of a more predicative phase (Reed, 1996; Di Paolo et al., 2018).

Notice in these examples that a proper understanding of agency is crucial to explain developmental transitions. They all involve transcending situations where the full activity of an agent breaks down due to alienating circumstances. Often accommodating such breakdowns requires relinquishing attempts to fully control the situation and becoming receptive to external guidance by others or by the world so that a way out of the deadlock can be found and enacted. These are cases where passivity can be crucial for the development of agency; without it we would remain very actively stuck in the same situation.

Our bodies, even in their organic dimension, change in response to linguistic and sensorimotor engagements, as in the adoption of external norms on health and beauty, in the choices of alternative ways to deal with illness, and in the medical risks associated with different kinds of labour.

All of this is telling us that we do not have a clear way to prioritize one dimension of embodiment over the others. Yes, it might seem trivial that without being an organic body first, sensorimotor agency cannot get off the ground, and without being a sensorimotor agent it is just not possible to participate in social and linguistic interactions. These are enabling relations. The unfinishedness of all agency, the developmental dimensions at play, the relations of mutual definition between all domains, and the sheer messiness of socio-material engagements we have just described, belie this simplistic picture. Working out how entangled kinds of agency relate is an open question that may admit contingent answers depending how

we navigate our multidimensional existence according to circumstances. Order of appearance does not tell us a full story and it certainly does not translate into valid claims to ontological (or any other kind of) priority. Chronology is not the same as history.

So, to speak of levels of agency in these cases can be confounding and obscure relevant complexities. It invites simplistic hierarchical thinking when we need better tools to fully disclose the varying relations both within and between human bodies.

What about instances of agency in systems that are themselves ‘composed’ by agents? Surely, we’re on firmer ground here since we have a relation of recurrency? Talking about levels may indeed be acceptable in some of these cases but I think it is generally risky.

Take the case of an insect colony and let us accept, for the argument’s sake (though this may be contentious), that in its constitution and domain of interaction it fulfils the three conditions for agency. The devil, as usual, is in the details. What is the insect colony made of? Of insects? Of particular behaviours and relations between insects? What about the traces of behaviours, patterns produced by insects that in turn constrain their agency (e.g., pheromone trails, underground ventilation systems, food caches, etc.)? An insect colony probably self-individuates as a network combining several of these processes plus some we don’t yet know about at more than just two scales. Thus, in what sense is it made of insects? Where is the recurrent relation and why not think about it in terms of participation or interaction? There is a difference in scale and there is decidedly an enabling role assigned to participatory processes acted out by individual insect bodies, but this is also the case in our examples of sensorimotor and linguistic development. And there is a mutual historical co-definition between insects and colony as there are mutual relations between pheromone trails, task allocation, and cached food. To think in terms of levels can lead us to impose distinctions where none are relevant or to ignore relevant distinctions that are relevant because they don’t suitably fit one level or another. Scaling relations in life and mind often belie a neat distinction between levels (e.g., Kello et al., 2010; Mora & Bialek, 2011) as cross-correlations are found across multiple continuous

scales sometimes originating in extended critical transitions (Longo & Montévil, 2014), weakening the idea of distinct levels.

It is hard to turn these complex scale relations into a definite ontological hierarchy such that level-talk would be firmly grounded. This does not rule out the possibility of aptly defining levels in a principled, operational way (as proposed by Longo et al., 2012), but this is hardly the road taken when discussing levels in biology and other disciplines. In my opinion, to readily adopt level-talk lacking such principled justifications makes it difficult to investigate these questions. Again, we would be driven to unwarrantedly conclude that a difference in scale indicates a difference in ontological priority, which is not likely to be true in our example because the existence of individual insects largely depends on the viability of the colony, and vice versa. Smaller does not mean more fundamental.

Conclusion

As an epistemic device, level-talk is ever tempting. It may be fitting in some cases, as in describing the relations between a multicellular body and individual cells, though even in this case, it may misdirect us into thinking that a body is completely composed by individual cells, which is most definitely not true: a body is also made up of extra-cellular matrices, fluids, and relations and structures of all kind which are not themselves cellular. Level-talk has the advantage of being easy to grasp, but this is also its problem: its directness obscures the complex involvement of (some aspects of) agents and non-agent processes, as well as the concurrent intersection of different kinds of agency in a ‘single’ entity. Level-talk draws us to hierarchical thinking, and this leads us to weak questions such as, ‘what’s more fundamental?’ or, ‘what comes first?’ As I have argued, neither differences in kind or in scale unequivocally translate into differences that might easily be placed on a hierarchy.

At this point the reader may wonder if this is not a storm in a teacup. As I mentioned briefly, linguistic agents must navigate a paradoxical tension between incorporating language and incarnating voices. The language we use thus literally changes our continuing becoming as linguistic bodies, specifically in this case, as members of a research community. We see

our objects of research differently, interact with them differently, and sometimes altogether fail to recognize their modes of existence if we offload too much of our thinking to alluring metaphors. In trying to understand agency in all its diversity of kinds and scales, genuine level-talk should be the result of an investigation, not its beginning.

Notes

1. The observer nevertheless does participate in the investigation of agency by deciding which phenomena to circumscribe, what processes to study and at what scales, with what questions and what interventions.
2. Or, alternatively, to a rejection of the theory or a dismissal of the case as a genuine instance of agency.

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