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Nature and Agency: Towards a Post-Kantian Naturalism

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Abstract
We outline an alternative to both scientific and liberal naturalism which attempts to reconcile Sellars' apparently conflicting commitments to the scientific accountability of human nature and the autonomy of the space of reasons. Scientific naturalism holds that agency and associated concepts are a mechanical product of the realm of laws, while liberal naturalism contends that the autonomy of the space of reason requires that we leave nature behind. The third way we present follows in the footsteps of German Idealism, which attempted to overcome the Kantian chasm between nature and agency, and is thus dubbed 'post-Kantian.' We point to an overlooked group of scholars in the naturalism debate who, along with recent work in biology and cognitive science, offer a path to overcome the reductive tendencies of empiricism while avoiding the dichotomy of logical spaces. We then bring together these different streams of research, by foregrounding and expanding on what they share: the idea of organisms as living agents and that of a continuity without identity between life and mind. We qualify this as a bottom-up transformative approach to rational agency, which grounds cognition in the intrinsically purposive nature of organisms, while emphasizing the distinction between biological agency and full-fledged mindedness.

Keywords Naturalism · Agency · Teleology · Organism · Biological autonomy · Enactivism

1 Introduction

It has become customary to distinguish Wilfrid Sellars' legacy into right-wing and left-wing Sellarsianism. The distinction is said to originate with Richard Rorty, who allegedly proposed it during a summer workshop in 1974 where Sellars himself was present (O'Shea 2016, 2). Right-wing Sellarasianism refers to the work of authors such as Millikan, Churchland or Dennett, who defend the primacy of the scientific image over the manifest image. Left-wing Sellarsiasianism refers to the position of authors like Rorty, McDowell and Brandom who instead defend the autonomy of the manifest image, stressing sui generis nature of human normativity and intentionality.[1] This division amounts to what McDowell has called 'two sorts of naturalism': while the former can be characterized as 'Empiricist' or 'neo-Humean,' in that it tries to reduce human agency to causal relations in nature, the latter can be variously defined as a form of 'relaxed' or 'liberal' naturalism (Fink 2006, 203–4), which manifests a clear Kantian inspiration in capitalizing on the irreducibility of the 'concepts of freedom' to the 'concepts of nature.'

In this paper we bring together recent work, both within and outside the naturalism debate, and show how it paves

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[1] As O'Shea has compellingly argued, this distinction can be traced back to a fundamental tension between two opposed commitments inherent to Sellar's own philosophy, namely: (1) His scientific naturalism, testified by the famous passage according to which "science is the measure of all things, of what is that it is and of what is not that it is not" (Sellars 1997, sec. 41) and (2) His Kantianism, which Sellars articulated in "pragmatist and later-Wittgensteian terms" (O'Shea 2016, (3). The attempt to reconcile these two commitments lies at the core of Sellars' entire philosophical project, and yet, as far as his legacy is concerned, it has given rise to two opposed approaches whose clash continues to this day.

the way for a genuine third way, alternative to both scientific and liberal naturalism: one which is capable of reconciling Sellars' commitment to both the scientific accountability of human nature and the irreducibility of the space of reasons to the realm of laws. We identify this approach as one which, broadly speaking, holds that agency and its associated concepts should neither be understood as the mere product of reductive mechanistic explanations (such as natural selection), as argued by teleosemantics, nor as a prerogative of the human 'space of reasons,' as argued by neo-pragmatism.

Such a position begins from a more nuanced understanding of the scientific image. Rather than postulating a priori limits to what the scientific image can or cannot accommodate, it takes seriously the view, increasingly defended by biologists and philosophers alike, that living beings can and should be understood as intrinsically purposive agents. We take such a view to have radical consequences for naturalism, insofar as the normative features of the space of reasons may find their natural ground in the purposive agency of life. We aim to advance this position by showing how it might articulate the continuity without identity between life and mind. This implies an account of the qualitative distinction between biological agency and full-fledged mindedness: cognition is grounded on biological agency, but constitutes at the same time an autonomous realm that is not reducible to it. We dub this a bottom-up transformative approach to life-mind continuity. This approach avoids both left-wing Sellarsianism, which bifurcates life and mind, and right-wing Sellarsianism, which reduces the mind to mechanism.

We qualify this position as a form of 'post-Kantian' naturalism. Its main commitment is to overcome the Kantian chasm between nature and freedom, by individuating the natural foundations of agency in the intrinsically purposive nature of living organisms. For German Idealists, the ontological status of organisms as purposive beings was deeply entangled with questions concerning the place of mind in nature. It is clear that today this relevance has been lost, much to the detriment of the naturalism debate, where teleology is understood in the narrow sense of a biological function determined by a past history of natural selection. As we shall argue, this is a radical departure from the way teleology was understood prior to the mid-twentieth century. Reevaluating this older conception of teleology is key for philosophical naturalism, insofar as it locates the wellspring of agency within nature itself.

Our argument proceeds as follows. Sect. 2 addresses the fundamental legacy of classical German philosophy for contemporary naturalism, especially concerning the notion of autonomy. Building on this, Section 3 points to current work within the naturalism debate that is making headway towards the position we recommend. In Sect. 4, we attempt to articulate the features of this position, pointing to recent work in biology and cognitive science which provides us with a rich notion of biological agency, while also doing justice to the distinctive features of human mindedness.

2 Levels of Autonomy as an Antidote to 'Leaving Nature Behind'

The question concerning the relation between nature and agency has deep roots in classical German philosophy. Kant was famously committed to a separation of the two, while post-Kantian philosophers tried to develop a framework capable of reuniting them. Less widely known is the role that organisms, and their putatively teleological character, played in these debates. As we shall argue, this importance has been largely lost on contemporary naturalists, much to the detriment of the debate. In this historical excursus, German Idealism is here framed as a philosophical template for a certain understanding of the relation between nature and agency: one that frames them as fundamentally continuous, while also not identical. We contrast this to the two other philosophical models that underwrite the naturalist discourse: the Humeanism of scientific naturalism, which attempts to reduce complex phenomena to the interaction of simple entities, and the Kantianism of liberal naturalism, which abides by a dualism of nature and agency.

In its Kantian formulation, the question concerning the relation between nature and agency is connected to the notion of autonomy. Kant defines autonomy as "the will's property to be a law to itself" (Kant 2012, section 4: 440; Guyer 2003a, b). This definition emphasizes the *sui generis* character of autonomy with regard to the necessity of the physical world: the will is autonomous from the laws of nature because it is constrained by its own self-given law, which provides the foundations for a normative order where agency is possible. This implies that autonomy is something that belongs to rational beings alone and is the result of a 'liberation' from nature. This idea is clearly represented by the Kantian distinction, formulated in the third *Critique*, between 'concepts of nature' and 'concepts of freedom' as defining the realms of heteronomy and autonomy, respectively.

This is a key point for liberal naturalists who, much like Kant, attempt to save the autonomy of the human sphere from the empiricist picture of nature as purely mechanical. This Kantian inspiration is manifest in the left-Sellarsian dichotomy of 'realm of laws' and the 'space of reasons.' In this respect, McDowell (2008, 94) explicitly contends that "in a Kantian spirit, we can refuse to accept that the structure of the realm of freedom can be naturalized" by examining the normative as a product of the natural. Liberal naturalists are thus profoundly Kantian in their denial that natural science can account for the agency of human beings: the realm of laws conveyed to us by the scientific image is a world of

heteronomous, blind mechanisms; agency requires autonomy, which defies that world, and can only be met within the more-than-natural space of reasons.

Interestingly, while agreeing with Kant on the division of logical spaces, liberal naturalists never engage with another part of Kant's philosophical legacy, namely his treatment of organisms. The complex ontological status of organisms continues to be a lively object of controversy both within Kant scholarship and in philosophy of biology more generally and it is impossible to do justice to such a rich debate here (see Gambarotto & Nahas 2022 for an overview). What is worth keeping in mind is that, for Kant, organisms seem to occupy a problematic space between the heteronomy of mechanical nature and the autonomy of reason. And yet, given Kant's firm commitment to Newtonian mechanics as the only legitimate causal explanation for natural phenomena, the ascription of intrinsically purposiveness to organized beings remains nothing more than a quasi-heuristic principle. This problematic status, which for some amounts to an 'unstable' position on Kant's part (Guyer 2001, Weber & Varela 2002; see also: Ginsborg 2001; Zammito 2006; Mensch 2013; Breitenbach 2014; Illetterati 2014) was the main object of the criticism directed to Kant by post-Kantian philosophers of nature (Richards 2002; Grant 2006; Illetterati 2016; Ng 2020; Gambarotto & Mossio 2022). It is precisely this criticism that we want to put back into the naturalism debate, which seems to be stuck in a Kantian framework.

The key feature of this Kantianism is the assumption of a 'demanding' sense of autonomy, where the ascription of agency and normativity to the behavior of a system necessarily requires the full dimension of rational personhood. This assumption also pervades recent approaches to organismal agency in philosophy of biology (Okasha 2018), which in trying to account for apparent agential features of organisms start from an inflationary conception of agency as *rational* agency, and then apply it in heuristic mode to biological systems. But if one starts from such a demanding sense of autonomy, anything below the human level will always fall short of the criterion. This, in turn, makes it difficult to portray rational autonomy as something natural and risks leading to a bifurcated vision of nature. As mentioned, this bifurcation was the main object of criticism in post-Kantian philosophy of nature. The key point of post-Kantian naturalism is precisely that autonomy does not come in black and white, but admits of degrees, the most important of these being the autonomy of living organisms, as agential (or at least proto-agential) systems whose behavior goes beyond what can be account for mechanistically.

With these considerations in mind, it is interesting to consider the reception that classical German philosophy had in Anglophone scholarship, and its relation to analytic philosophy more generally, which can perhaps be characterized as a progressive series of rehabilitations. In very general terms, landmark contributions by Strawson (1966) and Allison (1983), among others, began to turn Kant into a respectable interlocutor for analytic philosophers interested in epistemology. Pippin (1989) accomplished the more daunting task of doing so with Hegel, in opposition to which analytic philosophy has developed since its origins (with Russell's opposition to Bradley). The main points of Pippin's landmark book was to disengage Hegel's philosophy from the idea of a pre-Kantian metaphysical monism, and instead interpret Hegel's notion of *Geist* as the space of intersubjective practices, dubbed by Sellars as the 'space of reasons.' Hegel's project should thus be seen as fundamentally continuous with Kant's, but with the conspicuous difference that the transcendental would be thereby 'socialized' (Rand 2007).

This is the fundamental tenet of the current 'Hegel renaissance' in the United States, as a result of which to be Hegelian today means essentially to be a neo-pragmatist. On this view, the autonomy, normativity and agency that Kant grounded in the transcendental principles of reason should be rather considered the product of an intersubjective *Bildung* that provides human beings with the rationality required for the induction into the realm of freedom. Pinkard (2012) follows McDowell (1996) in insisting that the notion of 'second nature' serves to emphasize the natural rooting of *Geist*. And yet, this solution sounds very much like a wordplay used to mask a subtle dualism of nature and reason. On his part, Pippin (2002, 60) is rather explicit that "we are better off leaving nature out of the picture altogether, and that doing so begs no questions." The lack of reception Schelling had in mainstream analytic circles, and the unilateral reading of Hegel they propose, is arguably due to this widespread commitment to 'leaving nature behind.'

As we see it, a central aspect of post-Kantianism lies precisely in the attempt to overcome the reductive tendencies of empiricism while at the same time avoiding Kantian dualism. In fact, while Schelling and Hegel emphasize the irreducible features of mind with respect to nature, they also took great pain at emphasizing their radical continuity. We see their strategy as proposing an alternative route to philosophical naturalism, which is seldom considered in mainstream debates. This strategy consists in taking the Kantian analogy between life and mind at face value, embracing a form of life-mind continuity. In this picture, the structure of natural life is the same as the structure of mind, and rational powers are themselves derivative from the self-organizing dynamics inherent to living organisms.

As Grant (2006) has compellingly argued, the whole point of Schelling's *Naturphilosophie* is to move past Kant's "two-worlds metaphysics" by overcoming the sharp dualism between nature and mind. Schelling (1988, 42) is famous for having claimed that nature should be understood as "Mind made visible" and Mind as "invisible nature," and

that philosophy of nature "is nothing other than the *natural history of our mind*" (ibid, 30). In this respect, the spirit of post-Kantian philosophy of nature which we wake up aims to show how the complex components of the mind are the ultimate realization of self-organizing processes that take place in nature, and organisms play a particular mediating role between the heteronomy of mechanical phenomena and the autonomy of the mind (Schelling 1988, 30–41; 2004, 105–187). Capitalizing on Kant's definition of a natural purpose, Schelling submits that organisms should be understood as the wellspring of agency, pleading for a continuity between life and mind. He thus proposes an understanding of autonomy as something that comes in levels and degrees and levels: what we need to do to overcome Kantian dualism is to deduce the "dynamically graded series of stages" (Schelling 2004, 53) through which nature turns itself into an autonomous agent.

In a similar way, in his treatment of the animal organism Hegel connects the program of naturalization of intrinsic purposiveness to the natural grounding of subjectivity (Illetterati 2016; Gambarotto & Illetterati 2020). While preparing the materials of what would become the *Phenomenology of Spirit*, Hegel strongly criticized the so-called 'philosophies of reflection': with this term he identified the philosophies of Kant, Fichte and Jacobi, who considered subjectivity as an abstract, transcendental principle inherent exclusively to human cognition (Hegel 1977). The counterpart of this is the famous claim that the aim of philosophy is to understand reality not only as substance, but also as subject (1979, 10). What Hegel means here with subjectivity, however, is something entirely different from what was meant by the philosophies of reflections criticized in the Jena years. Subjectivity, in the concrete sense, is for Hegel a synonym of autonomy: a process that is no longer determined from the outside, but rather presents a form of self-grounding, and which is strikingly manifest in living organisms (Hegel 2010, 670–88; Gambarotto & Mossio 2022).

The crucial point here is that autonomy is not an exclusive feature of transcendental, rational subjects. The structure of subjectivity, along with the 'freedom' that it embodies, is the result of a dynamics inherent in nature itself, understood as a graded series of nested levels of autonomy, where the 'demanding' sense of agency is fundamentally rooted in the autonomous nature of life. As we see it, analytic Hegelians have erred in re-inscribing Hegel within a Kantian paradigm, and in effect negated the very point of Schelling and Hegel's critique of Kant to begin with. For the post-Kantians, we need to overcome the understanding of nature in terms of 'otherness' with respect to everything that we traditionally attribute to humans. Yet this does not mean that we need to completely remove all distinctions between organismal agency and the world of *Geist*, with its conceptual capacities, language and intersubjectivity. In fact, the continuity claim goes hand in hand with an idea of the cognitive as a further, independent level of autonomy. In this respect, the question of how we interpret the legacy of German Idealism can hardly be reduced to an exegetical matter, and rather hides deeper philosophical commitments concerning the relation between biological purposiveness and the placing of mind in nature. In the following section, we attempt to show how these commitments play out in contemporary naturalism debates.

3 Steps to a Post-Kantian Naturalism

In the previous section, we have pointed to German Idealism as the philosophical template for how we aim to approach the question of naturalism. In this section, we address the question of naturalism directly. First, we point out some relevant limitations with the current versions of naturalism, namely: the reductive character of scientific naturalism and the dualist inclinations of liberal naturalism. Secondly, we bring together the insights from an overlooked group of naturalist philosophers, who advance an organism-centered account of agency as the key to overcoming those limitations. On this background, in the following section we sketch our own version of this alternative form of philosophical naturalism, drawing on contemporary literature in theoretical biology and cognitive science.

3.1 The Limits of Contemporary Naturalism

It has become a common narrative that the problem of teleology is now entirely resolved (Mayr 1974). This story has its origin in the work of biologists and philosophers who took Darwin as showing that the appearance of design could be fully explained by the process of natural selection, whereby heritable variation in fitness causes descent with modification. For the partisans of the Modern Evolutionary Synthesis, providing a naturalistic explanation of the origin of organization in nature, Darwin became Kant's 'Newton of the grassblade' whose coming he had deemed an impossibility (Kant 2000, 5: 401; Cornell 1986; Moss & Newman 2015). This 'naturalization' is synonymous with a 'mechanization' that deprives living organisms of all autonomy, by portraying them as passive objects of environmental pressures.

The Modern Evolutionary Synthesis further advanced this by combining a Neo-Darwinian understanding of population change with the Mendelian theory of inheritance. This process was completed in the second half of the twentieth century through advances in molecular biology which led to the infamous 'cracking of the genetic code.' Leveraging the language of information, program, code, and communication from the cybernetic movement, biologists took up a new

term, *teleonomy*, to designate a new understanding of the apparent purposiveness of organisms as being fully explicable in terms of a genetic program (Mayr 1961; Monod & Jacob 1961; Jacob 1970; Monod 1972). Genes provided a proximate explanation of an organism's development, structure, and behavior which could be paired with the ultimate explanation of evolution by natural selection.

Most current attempts to use teleology as a way to place normativity within a scientific image rely on this mid-twentieth century notion of *teleonomy*. Undoubtedly the most prominent of such accounts is teleosemantics, which aims to provide a naturalistic account of intentionality by grounding the capacity for mental representation in the evolutionary history of the organism (Macdonald & Papineau 2006; Millikan 2017; Neander 2017). This capacity for representation is itself understood as an evolved adaptation that can be accounted for on an etiological view of biological functions. A frog's visual system, for instance, has the function of correctly representing flies because such a function enhanced the fitness of the frog's ancestors. This function is thinly 'teleological' only in the sense that the goal of the visual system is to function as it was selected to function.

For liberal naturalists like Macarthur (2018a; 2018b) the fundamental problem with this 'mechanistic' account is rooted in its claim to be able to offer a complete picture of human agency. As we see it, he is right in claiming that "teleosemanticists such as Ruth Millikan are mistaken when they suppose that an appeal to 'biological norms' solves the problem of rational or conceptual normativity in the setting of a scientific naturalism that only recognizes causal or functional happenstance" (2019, 570). Indeed, the liberal naturalist ought not to accept an account of representation or normativity which is not grounded in a robust notion of agency. The problem, however, is with the assumption that doing so requires a split between the manifest and the scientific image.

For Macarthur, naturalism must do better than needing metaphysical legitimacy from science: it must rather interpret science as a demarcated operation within a more fundamental human social sphere, which cannot be accounted for in empirical terms. This strategy is profoundly Kantian in nature as it implies a form of dualism between human beings, qua rational animals, and the rest of nature. This was clearly expressed by McDowell (1996) who, despite rejecting "the Cartesian idea that brutes are automata," abides by a the conception of nature as the realm of law and of organisms as "merely natural," which seem to commit him to a mechanistic understanding of life and non-human cognition. For instance, he speaks of "dumb animals" that are "natural beings and no more," whose "being is entirely contained within nature" (Ibid, 70) and bound by "immediate biological imperatives" (Ibid, 115), which despite his claims to the contrary, have a strong mechanist flavor.

This has not escaped the eye of critics. Hurley (2003, 244), for example, suggests that we should not take apart normative features of mindedness from the rest of nature, because "normativity admits of different kinds and degrees," and the spectrum of natural agency occupies "a normative middle ground between a mere stimulus-response system and full context-free conceptual abilities" (Ibid, 235). Similarly, Lovibond (2006, 270–71) argues that "McDowell does not dwell on those elements in the life of other species which stand out as evolutionary ancestors of our own exercises of Kantian spontaneity" and thus "expresses a kind of dualism," although of the "non-rampant" kind.

3.2 The Logical Space of Life

The drawbacks with both scientific and liberal naturalism call for a third approach, which is neither reductive nor dualist in nature. We dub this form of naturalism as 'post-Kantian' insofar as it is committed to overcoming the apparent opposition between nature and autonomy by articulating an idea of autonomy as something that comes in degrees, and thus grounding the emergence of conceptual capacities on the purposive, self-organizing, autonomous nature of living organisms. We see this approach as a broad tent which includes a number of insights that have been argued for by a minority of scholars in the naturalism debate.[2]

A notable sign of discontent with liberal naturalism was Dreyfus' (2005) criticism of McDowell, which led to their famous debate (Schear 2013). While the core of the debate concerns the nature of perception, it can be fruitfully interpreted as a clash of perspectives on the placement of agency in nature: McDowell argues that the emergence of agency is mediated by the acquisition of conceptual capacities, Dreyfus contends that agency is inherent to the embodied coping we share with non-linguistic beings. Dreyfus felt that a major emphasis on conceptual capacities ends up opening a

[2] A standard reference on the relation between nature and agency is Michael Thompson's *Life and Action* (2009), which does not appear in our review. There are two reasons for this: 1) Thompson's notion of a 'life-form' is a concept of the manifest image. As argued by Hurley (2009), in fact, Thompson "does not give us an 'empirical' account of life, it presupposes a decidedly non-scientific understanding of life-form." In fact "his concept of a life-form is different from and less determinate than the concept of a species that is deployed in biology." Thompson is thus ultimately in line with liberal naturalist arguments in favor of the autonomy of the manifest image. Our concept of life, on the other hand, aims to be solidly rooted in the scientific image. 2) Thompson employs natural-historical judgments from within the manifest image in order to ground normativity in nature. These judgments concern organisms as bearers of specific life-forms and are grounded in the Aristotelian notion of *species* (the type of a token). We qualify this as the manifest image equivalent of the lineage-based account of teleosemantics, from which we also diverge. Contrary to both, in fact, our focus is firmly set on the agential capacities that organisms display in virtue of their biological individuality.

chasm between adult humans, who can be properly understood as agents, and the rest of nature.

In order to avoid such a chasm, Dreyfus argues that we need to assume a third logical space, located between the mechanical realm of law and the human space of reason which, drawing on Merleau-Ponty, he dubs the 'space of motivations' (see also O'Conaill 2014). This third logical space marks what Gibson (2014) defines as the landscape of affordances: the space of possibilities for action available to the organism, which marks the difference between the simple *Umgebung*, the mere geographical environment, and its *Umwelt*, the proper behavioral milieu of the organism (Uexküll 2010; Canguilhem 1952). In this perspective, affordances are intrinsically normative insofar as they show up in relation to the goal-directed activities of living beings.

Following a similar line, Orkent (2007, 2018) has made an extended case for the relevance of life as intrinsically purposive for the question of naturalism. For Okrent (2007, xi), "intentionality is rooted in teleology; the aboutness of mental life is rooted in the goal-directedness of active life." He thereby criticizes liberal naturalism for taking a human exceptionalist stance, but also teleosemantics, for its exclusive focus on the mechanism of natural selection (2007, 94–95). To understand why such-and-such an organism has a trait in the first place, we must invert the teleosemantic equation by establishing the way goals precede functions: a trait is functional only insofar as it develops in the context of an active, adaptive, and self-organizing system and contributes to its goal-directed behavior.

On his part, Sachs (2012, 132) attempts to integrate the left-Sellarsian approach to normativity within an embodied perspective inspired by Merelau-Ponty. Arguing that "McDowell seems to be poised on the slippery slope towards the Cartesian view that animals lack mentality as such" he submits, like Dreyfus, that in order to avoid this we need a third logical space in between the realm of laws and the space of reasons to account for animated life. This need is addressed via the Sellarsian distinction between 'signifying' and 'picturing' (Sachs 2019): while signifying describes the full-fledged conceptual capacities that open up the space of reason inhabited by linguistic, rational animals, picturing defines the larger landscape of affordances and non-conceptual sense-making inhabited by all living organisms qua purposive, autonomous agents (Sachs 2022).

Finally, Rouse (2015, 2022), submits that we should "account for our own capacities for scientific understanding as a natural phenomenon that could be understood scientifically" (2015, 6). Far from being a fixed and unified set of facts about the world, the scientific image must be understood in terms of scientific practice, one which is highly disunified, continually directed and organized toward what is yet unknown or in need of refinement. Though this seems to echo what Macarthur has recently argued, Rouse draws the opposite conclusions: he sees the full consequences of this view to lead *out* of liberal naturalism into a kind of *radical* naturalism, which defends a scientifically-driven self-understanding. Against the liberal naturalist dogma, Rouse recognizes the normativity of meaning as a scientifically intelligible phenomenon, and a key role in his enterprise is played by the biological notion of niche construction, which presupposes a conception of the organism as an entity which shapes its own evolutionary trajectory by acting in a goal-directed way.

Though each of these authors makes distinct and original contributions to a third way for philosophical naturalism, it is striking to notice the central importance that biological agency plays in each of their accounts. However, much work remains to be done in clarifying the conceptual and theoretical scope of biological agency. In the following section, we attempt to show how recent developments in biological theory, which are consistently ignored in mainstream debates, can positively contribute to the elaboration of this concept and provide the foundation for a third way for naturalism.

4 Rooting Agency in Nature

We have argued that the contemporary naturalism debate is stuck in what we deem to be two unattractive options: one which collapses into reductive eliminativism about the existence of agency, and the other which adopts a kind of 'soft' dualism in both restricting agency to human beings and rendering it scientifically inexplicable. We wish to defend a third option, various aspects of which we find already articulated in the work of scholars discussed in the preceding section. We agree with Okrent (2018) that a historical and conceptual re-evaluation of teleology is absolutely fundamental to this project: the teleology which Kant all too daringly suggested resides in the self-organizing power of life, which was taken up by his German idealist successors, and persisted through various movements into the twentieth century (notably by continental biophilosophy and philosophical anthropology, in authors such as Plessner, Ruyer, Jonas, Canguilhem, Merleau-Ponty, and Simondon). And if we are to believe Sachs (2022), this insight was in many ways adjacent to Sellars' own thinking.[3]

What remains now is to outline this path not taken by the mainstream of the naturalism debate. We argue that contemporary perspectives on the nature of organisms provide us with a robust, naturalistic account of agency, which ought to satisfy both right and left-wing Sellarisans in being both

[3] It is worth noting that, however, that to our knowledge Sellars never mentions the third *Critique*, despite having written extensive commentaries on Kant's philosophy of mind and metaethics.

scientifically accountable and non-reductive. The idea that such commitments are mutually incompatible rests on mistaken assumptions about what the scientific image is able to accommodate (Rouse 2015). The central challenge for a biologically grounded notion of agency is to be able to simultaneously trace the continuities *and* discontinuities between a primitive concept of agency and the full-fledged features of human cognition, with its conceptual capacities and propositional attitudes.

Though we cannot hope to achieve this here, we aim to outline the path which may eventually lead to such an account. First, we aim to show how contemporary advances in evolutionary biology and complex systems science contribute to our understanding of agency as a natural phenomenon (4.1). Secondly, we address the relation between organismal and human agency, where the latter is understood as a novel instantiation of embodiment: fundamentally grounded in the purposive agency of organisms, yet implying an entirely new form of relationship between organism and environment (4.2).

4.1 Life: Making Sense of Organismal Agency

The last two decades have witnessed a questioning of the geno-centrism that has dominated our understanding of evolution since the establishment of the Modern Synthesis in the 1940s. Key developments in the study of epigenetic inheritance (Jablonka & Lamb 1999; 2005), developmental plasticity (West-Eberhard 2003), niche construction (Odling-Smee, Laland, & Feldman 2003), along with the emerging field of Evolutionary Developmental Biology (Fusco & Minelli 2008; Minelli 2009), are contributing to put the organism back at the center of biological theory (Bateson 2005; Huneman 2010; Nicholson 2014). In fact, one way or another, all these strains of research tend to put theoretical pressure on 'what genes can't do' (Moss 2004) and seem to presuppose the idea of organisms as biological agents.

This idea was already advanced in Lewontin's (1985) notion of organisms as active subjects of evolution, but has only recently led to explicit calls for an agent perspective in evolutionary biology (Walsh 2015; Jaeger 2022). Such calls submit that, as an object theory, "the Modern Synthesis cannot simply assimilate the organismal perspective as an add-on" (Walsh 2015, xii). To integrate the contribution of organisms within evolutionary biology, "we need a battery of theoretical concepts and methods to describe this range of facts: *goal*, *means*, *affordance*, *repertoire*, *salience*, *reciprocal constitution, normative requirement*, *hypothetical necessity*, *teleology*" (Walsh 2018, 274).

This has recently led to the development of an ecological approach to organismal agency. For supporters of this approach, "although agency is mechanically realized, agency is not itself a mechanism but a gross dynamical pattern of adaptive, purposive behavior" (Fulda 2017, 72; see also Walsh 2015, 210). In other words, theorizing the role of agency in biology does not require a causal-mechanical story. Rather, the concept is scientifically legitimized by its indispensability in explanations of particular modal relations and regularities we find in biology. This mirrors the way agency and associated concepts are used to explain phenomena in psychology, but also the way in which concepts like viscosity and temperature, for example, do not require for their explanatory use the citing of specific mechanical micro-conditions that realize the phenomenon (Fulda 2017, 83; Walsh 2018, 171–172). Such arguments push us to liberalize our understanding of what counts as legitimate scientific explanations, and show that they are not narrowly restricted to reductive mechanical analyses.

In this perspective, agency is "the gross behavioral capacity of an organism to bias its repertoire in response to what its conditions afford for attaining its goals" (Fulda 2017, 84; Walsh 2015). The three key concepts in this definition are *repertoire*, *affordance*, and *goal*. A repertoire designates the range of possible responses that an agent might have in the pursuit of its goals. This repertoire is biased by what the agent senses in its environment, what it deems salient, and therefore meaningful, in the pursuit of its goals. Goals, in turn, are end states that a system attains "and would reliably attain across a range of counterfactual circumstances" (Walsh 2018, 172). Where there are goals, there are also means, which are simply the actions within an agent's repertoire which it can deploy to achieve its goals.

From this perspective, agency is an ecological phenomenon insofar as it is defined in terms of a relationship between the agent and the environment, specifically in the way an agent is able to attain its goals by navigating an environment that shows up as meaningful opportunities for action. In a recent paper, evolutionary ecologist Sonya Sultan and her colleagues highlight the way such an agency perspective might bridge three major explanatory gaps created by gene-centrism in biology (Sultan, Moczek & Walsh 2021; see also Walsh 2014). They show how an agency perspective can decisively advance our understanding both of processes internal to the organism and the interactive dimension of organisms and their niche, while also making explicit four ways in which agency can be implemented into contemporary research programs.

These recent developments in evolutionary biology are increasingly vindicating another long-standing tradition, concerned with the notion of autonomy as a defining feature of living systems. The autonomy tradition has worked to provide a naturalistic account of agency, focusing on the organizational conditions that need to be realized for a system to be an agent. Given the context we have outlined, the question of how this tradition can be integrated into mainstream biology poses itself with cogency. Moreover, given

that mainstream biology largely abides by the philosophical creed of scientific (i.e. reductive) naturalism, this question broadens to the point of asking what the autonomy framework can contribute to our understanding of naturalism in general, which is our focus here.

The framework of autonomy develops a set of ideas that were first put forth by complex systems theory in the twentieth century, which conceptualized goal-directed systems as those that self-organize spontaneously under specific conditions and have the capacity to actively maintain themselves in the face of environmental perturbations. A classic example, which is frequently cited in this literature is that of an autopoietic proto-cell. Such a system consists in a cyclical chemical reaction which produces, as one of its bi-products, molecules which spontaneously assemble into a semi-permeable membrane. The membrane then acts as a barrier that both demarcates the system from an environment, and selectively filters what substances pass through it.

This autopoietic model was first inaugurated by Humberto Maturana and Francisco Varela (1980). Their work was influenced by cybernetics, which theorized the notions of control and regulation in terms of negative feedback, and through Ross Ashby, the notion of homeostasis. At the time of their work, the movement had turned into second-order cybernetics, which sought to draw out the consequences of the idea that a cybernetic system has a 'point of view' (Froese 2010). These influences combined in the idea that organisms are 'homeostatic machines' (Froese & Stewart 2010; Bich & Arnellos 2012). Maturana and Varela's goal was to specify the abstract organizational principles from which the characteristic, 'autonomous' behaviors of organisms are derived, and from that clarify the 'ontological grounding' for the problem of observation by specifying the necessary and sufficient conditions for a system to be an observer in the first place. This led to one of their most influential theses: "Living systems are cognitive systems, and living as a process is a process of cognition" (Maturana & Varela 1980, 13). Underpinning this was the claim that life and cognition emerge from the same kind of abstract organizational principles, those which define a given system as 'autonomous' and thus as an 'observer.'

The autopoietic model came under intensifying scrutiny in the early 2000s (Bourgine & Stewart 2004; Bitbol & Luisi 2004; Di Paolo 2005). One of the recurring points of contention was the great emphasis which Maturana and Varela put on the organizational principles underpinning the 'autonomy' of living systems, thereby giving a secondary role to the various 'interactive' processes that occur between organism and environment, which included the way the system-environment relation becomes one of sense-making. Operational closure was ultimately what they deemed to be the necessary condition for autonomy; the system could 'specify itself' through its own activity. This highly internalist notion was thought sufficient to derive any of the behaviors of the system with its environment, where any change of state would be wholly determined by the autopoietic organization itself rather than external factors (Varela 1979, 55; Maturana & Varela 1980, 92).

There are two problems with the original formulation of autopoiesis, which have been so far emphasized in the literature First, while it is strongly focused on operational *closure*, it does not put enough emphasis on the necessary thermodynamic *openness* (i.e. openness to flows of matter and energy) which any complex system must have to stay alive (Moreno & Mossio 2015, 6). Second, as Di Paolo (2005) has made clear, being almost exclusively focused on self-maintenance, the original autopoietic model does have the resources to account for minimal cognition, agency and sense-making. Di Paolo makes this case by distinguishing two ways in which a system can withstand external perturbation: it can either be *robust*, or *adaptive.* The former designates what he takes to be a minimal autopoietic system: by being thermodynamically open, it can exchange matter and energy so as to perdure in far-from-equilibrium conditions. Adaptivity, on the other hand, "*is a special manner of being tolerant to challenges by actively monitoring perturbations and compensating for their tendencies*" (Ibid, 438, emphasis added). Though it is possible for some autopoietic systems to exhibit such behavior, this does not follow from the definition of autopoiesis: only systems with such adaptive capacities should be deemed 'agents' that make 'sense' of their environment (see also Weber & Varela 2002).

In light of these two problems, contemporary accounts of biological autonomy have been careful to establish the thermodynamic principles underpinning autonomous systems, while also carefully distinguishing the various forms that autonomy takes. This has resulted in a distinction between *minimal* autonomy and *adaptive* autonomy. The former specifies the simplest forms of self-maintenance, which establishes (1) A simple kind of goal-directedness, wherein the system strives to persist through its own action, and thereby interacts with the environment in an asymmetric way; (2) A minimal notion of normativity, grounded in the precarity of the system; and (3) A minimal form of identity, whereby the system constitutes and demarcates itself as an autonomous system (Di Paolo, Buhrmann & Barandiaran 2017).[4]

Adaptive autonomy, in contrast, is the more refined capacity to modulate, or functionally constrain, the system's interactions with its environment. It is here that we begin to see the emergence of a generic capacity to cope with challenges which the system encounters in the world as it pursues its goals, even in wholly new contexts (Moreno & Mossio 2015,

[4] Mossio and Moreno (2015 92-93) make a similar proposal, though they appeal to four criteria rather than three.

Chap. 4; Roli, Jaeger, and Kauffman 2022). It is also in this context that we find the emergence of a capacity to monitor, detect, and evaluate (and eventually anticipate) cues from the environment in order to select appropriate actions in such a way as to avoid deleterious effects. This grounds a minimal capacity for 'sense-making' in the sense that actions are guided by specific, recognized features of the environment that are relevant to the goal directed activity of the system. This forces a radical reconceptualization of the notion of environment from the mere summation of entities outside the organism to a landscape of affordances.

As Okrent (2018 ch. 3) argues, normativity in its most primitive form would refer to a basic sense of 'norm' in the sense of a required standard. Autonomous systems exist in a precarious state and must act in a specific way in order to keep themselves alive. This is the most basic sense of a responsiveness to norms which comes in many gradations, as more complex capacities emerge over the course of major transitions in evolution, with some milestones including associative learning, learning from errors, the capacity for beliefs and desires, rational coherence, and instrumental reasoning (see also Ruiz-Mirazo et al. 2004; Ruiz-Mirazo & Moreno 2012; Ginsburg & Jablonka 2019). Whether this legitimates the claim that adaptive autonomous systems act in normative ways (e.g., Barandiaran et al. 2009; Moss 2017) is an open question. As with the concepts of autonomy and agency, the meaning of normativity is intentionally stretched beyond its usual scope. This move seeks to draw our attention to underappreciated continuities between human and non-human life-forms. The challenge, however, is to draw such continuities without collapsing the evident differences between human and non-human responsiveness to norms.

4.2 Mind: Organismal Agency and the Space of Reasons

Attempts to make sense of the relation between our phylogenetic past as animals and our status as creatures of the space of reasons have broadly come in two flavors: so called 'additive' and 'transformative' models of rationality (Boyle 2016). In an additive model, "we rational animals perceive and desire in the same sense in which any animal perceives and desires; the power that differentiates our minds is something separate and additional" (Boyle 2016, 2), while on a transformative model, "our rationality does make a basic difference to the nature of our perceiving: it gives us a 'special form' of perceptual sensitivity to our environment" (Ibid, 4). The debate between Dreyfus and McDowell is by and large a debate between these two models.

The transformative approach emphasizes the discontinuity between rational and non-rational cognition, yet the point is how such discontinuity squares with the notion of organismal agency. As Testa (2021, 126) has it, in the kind of transformative model put forward by McDowell "rationality reshapes top-down our bodily nature and has authority over it without being reciprocally influenced by it." Prominent additivist models, in contrast, can be said to be bottom-up insofar as they attempt to account for human agency on the basis of a more fundamental feature. We take both views to be problematic in certain respects, and offer a *bottom-up transformative* account, based on the notion of autonomy as something that comes in levels and degrees.

The top-down approach embraced by McDowell takes the establishment of conceptual capacities to issue a radical change to our landscape of affordances. Unlike any other animal, we inhabit a niche of symbolic, social, and linguistic affordances. McDowell is right in this respect. However, he does not have a solid theoretical basis to tell us exactly *what* is being transformed and *how*: even if we take McDowell's 'anti-mechanistic' and 'anti-Cartesian' claims at face value, his pronouncements need to be backed by a positive account of the specific kind of agency that is at play on a biological level, which provides the necessary scaffolding to understand distinctively human norms. Dreyfus' additive model has the opposite problem: he conceives our responsiveness to affordances as tied to our embodied, pre-conceptual engagement with the world, which is more fundamental than the realm of concepts and reflective thought. The space of reasons is thereby reduced to embodied coping, while rationality is considered just an add-on to the perception of affordances shared with non-rational beings. In some respects, the same bottom-up logic is at work in teleosemantics, which portrays the human capacity of representation as just another 'biological category.' In both cases, the normativity of meaning is subsumed under a more fundamental level, be it embodied coping or the normativity of functions.

A major role in any transformative approach is played by the notion of *habit*, a concept that plays a central role in Hegel's anthropology as the mediator between first and second nature (see Peters 2016; Khurana 2017; Testa 2020). Much hangs on how one understands this mediating role. Barandiaran and Di Paolo (2014) have distinguished two main trends in the conception of habits: an *associationist* and *organicist* trend. In the former case, habits are conceived as rigid, automatic behaviors blinded responsive to external stimuli, while the latter are understood as adaptive, self-sustaining networks of embodied neural patterns that generate dynamic sensorimotor loops (Ramírez-Vizcaya & Froese 2019; Menary 2020; Miyahara, Ransom & Gallagher 2020). The bottom-up transformative approach we recommend rejects the associationist idea of habit as a productive tool to understand organismal behavior, and capitalizes on the organicist trend that finds in German Idealism a representative of particular importance: "instead of framing the discussion of habits in terms of a contrast between automaticity and mindful actions, this approach invites us to think

in terms of a continuity between *biological autonomy* and *sense-making*" (Ramírez-Vizcaya & Froese 2019, 4).

It is important to emphasize how this whole project is fundamentally connected to a notion of organismal agency, in opposition to the geno-centrism of biology and the computationalism of cognitive science that dominates the scientific image of contemporary naturalism. Recent developments in biological theory have led to a rejection of the idea that organisms are machine-like. Many now embrace a conception of genes not as direct instructions, but as scores that must be interpreted in relation to the environment (Oyama 1985; Oyama et al. 2001). The same is true for the emergence of cognitive abilities: behavior is instituted by habits as sensorimotor patterns that are always flexible and open to change (Menary 2020; Roli et al. 2022), and thus cannot be reduced to simple input-output relations orchestrated by 'instincts,' which in turn are the result of mechanically established genetic instructions. Both genetic makeover and behavioral patterns of organisms are the result of an ongoing dialectics between the living agent and the environment. Habits as self-reinforcing processes allow the organism to obtain the best possible attunement to the environment (Egbert & Barandiaran 2014) and constitute the groundwork for cognition as such, not only complex forms of cognition involving conceptual capacities.

As Barandiaran (2017) emphasizes, this theoretical framework is pluralist in the sense that it allows for autonomy to be exhibited in a variety of qualitatively distinct forms. From the cooperation of multiple, previously autonomous cellular autonomy emerge higher levels of multicellular autonomy, which enable distinctive forms of behavioral agency and new kinds of responsiveness to norms (see Okrent 2018).[5] It is important to stress that in each of these transitions, the previous form of autonomy enables and constrains the next, but does not determine it (Di Paolo et a. 2017). With more complex attunements to the environment come new ways of coping: what features of an environment afford action is dependent on the kinds of skills an agent has, or the breadth of its behavioral repertoire (Rietveld 2008; Rietveld & Kiverstein 2014; Walsh 2015).

The habitual deployment of actions to recurring affordances becomes the building blocks of self-sustaining ways of life. A habit can be understood as "a self-sustaining pattern of sensorimotor coordination that is formed when the stability of a particular mode of sensorimotor engagement is dynamically coupled with the stability of the mechanisms generating it'' (Barandiaran 2008, 281). In other words, habits are the natural outcome of self-sustaining sensorimotor schemes that integrate the system with its environment (Di Paolo et al. 2017). Distinctive norms emerge because habits enable a way of life that is always precarious and open to disruption (Ergbert & Barandiaran 2014). It takes the adaptive capacities of sensorimotor agents to plastically reconfigure their sensorimotor schemes in order to deal with novel challenges encountered in their environments.

It is this form of sensorimotor agency, grounded by but not reducible to more basic forms of biological autonomy, that is a precondition for distinctively human forms of agency. We therefore reiterate that human mental life exhibits a simultaneous continuity *and* discontinuity with more basic other forms of agency found in other living beings. This is the crux of bottom-up transformationism, and importantly, we do not see any reason why this discontinuity should pose a particular problem when it comes to understanding it scientifically. Just as sensorimotor agency is not merely a simple form of biological agency with added sensorimotor capacities, but rather constitutes an entirely different way of life, the transition to linguistic and participatory sense-making involves a radical transformation into a wholly new way of life.

As Rouse (2015, 77) has it, "we are linguistic/discursive beings and not merely animals with an evolved capacity for language." This linguistic way of life is distinguished insofar as it is lived in a landscape of linguistic and social affordances which requires decidedly different interpretive skills to not only be sensitive to, but to skillfully navigate (Rouse 2015, 141). It requires, for example, the capacity to make sophisticated inferences about the expectations, needs, and desires of others (Veissière et al. 2020). Our (often implicit) awareness of what others expect of us plays a key role in establishing shared norms and expectations about what features of our environment we ought to attend to. This way of life, which developed gradually over evolutionary time, has profoundly shaped the trajectory of our evolution and development as a species (Deacon 1998). There is therefore a real sense in which it is a distinctively new kind of agency "which does not contradict life-mind continuity, but on the contrary is only understandable through it, as a dialectical development of the relations between organism and environment" (Di Paolo et al. 2017, 178).

In sum, we take the notions of minimal and sensorimotor agency to provide a scientifically amenable framework for understanding the relation between life and mind. Habits are sensorimotor patterns that become part of an agent's behavioral repertoire, but always in a plastic way that is open to re-attunement. Habits always exist in the context of an organism-environment dialectic, whereby the environment is understood as a landscape of affordances. Human agency is a most recently evolved, highly divergent kind of agency, enabled by sensorimotor agency but not determined

[5] For a more detailed account of the evolution of sensorimotor agency, particularly how a physical coupling becomes a sensorimotor one through the emergence of novel sensory and effector organs that allow for sensitivity to specific material features of an environment, see Di Paolo et al. (2017), ch. 6.

by it. The distinctively social and linguistic skill-set we have acquired, which includes an habitual attentiveness to other's expectations about how we ought to think and act, is a new way of life that brings into being its own kind of normativity.

5 Conclusion

This paper has attempted to outline a distinctive approach to naturalism which we deem to be a valuable alternative to both scientific and liberal varieties. We dub this particular approach 'post-Kantian' as it follows the lead of Schelling and Hegel in grounding cognition in the intrinsically purposive nature of biological systems, while also abiding by a qualitative distinction between biological agency and full-fledged mindedness. We are not the only, nor the first, to argue for such a position, but we deem it important to show how the various authors we have discussed come together on a number of central points. Though they have been secondary to our concerns, it is worth emphasizing that there remains significant intramural disputes on several fronts, and that we do not advocate a simple amalgamation of views. Our synoptic perspective was aimed at emphasizing what these positions seem to share, namely the idea that organisms are intrinsically purposive, agentive systems, and that there is a fundamental continuity, though not an identity, between life and mind.

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