



Organizational normativity and teleology: a critique

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Abstract

In recent years, so-called organizational accounts (OA) have emerged in theoretical biology as a powerful, viable strategy for naturalizing teleology and normativity. In the wake of the theoretical tradition of autopoiesis and biological autonomy, OA notably propose a new meaning for the notion of “organization,” which they claim to be capable, among other things, of grounding objective and observer-independent normative teleological ascriptions. In this paper, I focus on this last claim, asking “How are ‘organization’ and ‘normativity’ conceptually connected?” The basic insight mobilized by the OA framework to answer this question is most often expressed as a counterfactual argument regarding the “conditions of existence” of organized entities. In this paper, I show that careful scrutiny of this core OA argument reveals a substantial shortcoming. To make this point, I first analyze how the OA framework positions the idea of “conditions of existence” via the notions of “dependence”, “constraint,” and “closure.” Second, I consider various possible interpretations of the OA counterfactual argument grounding norms. I conclude that the implications of this argument do not enable OA to deliver what they promise, i.e., a straightforward link between organization and norms. I argue that a different strategy is needed to capture the basic organizational intuition about biological normativity and suggest that a stipulative route might be better suitable to that end.

Keywords Organizational accounts · Teleology · Normativity · Biological normativity · Functions · Naturalisations of norms

1 Introduction

In recent decades, philosophers have discussed various attempts to understand *teleology*, *functionality*, and *normativity* in the biological domain, especially in relation to phenomena regarding living beings (Garson, 2016, 2019). Within such debates, the

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model offered by so-called organizational accounts (OA) has emerged as one of the most important players.¹

In a theoretical context in which the notion of organism is being reevaluated as a relevant category—and new conceptual tools for understanding the organism’s structure and role in phenomena related to life are being developed²—the organizational approach takes up and develops a series of intuitions drawn from the theoretical tradition of ‘autopoiesis’ and ‘biological autonomy’ (Weber & Varela, 2002, Maturana & Varela, 1980) to articulate a new model of organism in which the notion of “organization” plays a central role in understanding various systems, especially living ones. Notably, these views are considered animated by the insight that organisms are distinctly characterized by “autonomy” or “self-determination”.³

The conceptual apparatus put in place by the OA approach has been quite attractive to scholars. Many have considered it capable of providing a viable conceptual frame for the idea that organisms are autonomous entities capable of maintaining themselves and producing their own components. The OA also offers new ways of understanding many basic structural and relational features of living organisms (Ruiz-Mirazo & Moreno, 2004; Ruiz-Mirazo et al., 2017, Bich & Damiano, 2008; Bich & Arnellos, 2012; Bich, 2018; Mossio & Moreno, 2010; Moreno & Ruiz-Mirazo, 2009) and, over the years, has been progressively enriched. Proponents maintain that the concept of autonomy provides a lens allowing us to look at not only single organisms but also their cross-generational relations (since they exhibit organizational closure), such as the phenomenon of heredity (Saborido et al., 2011, Mossio & Pontarotti, 2019). The OA framework also argues that the phenomenon of biological pathology can be approached organizationally (Saborido & Moreno, 2015) and that ideas related to biocentrism, for instance, can profit from organizational insights (Holm, 2017). The conversation is still open, and the ongoing debate around it—for instance regarding

¹ The OA emanates from the more encompassing theory of autonomy and is by now well-known. The most important representative works in the area of OA include Moreno & Mossio (2015), Mossio et al. (2009), Montévil & Mossio (2015), Bich & Mossio (2011), Mossio & Bich (2017), Mossio et al. (2016), Mossio & Moreno (2010), Ruiz-Mirazo & Moreno (2004), Bich et al. (2016), Ruiz-Mirazo et al. (2017). This group of views are sometimes called “organizational approaches” to do justice to their variety of interests and foci. However, they share a common conceptual core. I will use “account” and “approaches” interchangeably and focus on their shared conceptual core, elaborating in which features I am interested over the course of the paper.

² For a defense of the claim that “organism” is a highly relevant notion in biological theories and should be put back on the agenda of biologists and philosophers of biology, cf. Gilbert and Sarkar (2000), Bich and Damiano (2008), Pepper and Herron (2008), Walsh (2015), Huneman (2010), Nicholson (2013, 2014), Toepfer (2012), Toepfer and Michelini (2016), and Cornish Bowden & Cárdenas (2019).

³ This insight animates a longstanding tradition that dates back to at least Kant and which, in the wake of the success obtained by OA, has recently been unraveled by scholars. Figures belonging to the “prestigious history in philosophy of science and theoretical biology” (Mossio & Bich 2017, p. 12) that positions “organization” as the key concept for understanding life (and its normativity) include Claude Bernard, thinkers in the cybernetics tradition, and Jean Piaget (the first to explicitly formulate the notion of closure)—and continues through the work of Hans Jonas, Varela’s and Maturana’s insights on biological autonomy, and the theories developed by Robert Rosen and Stuart Kauffman (c.f. Bich & Mossio 2011; Bich 2018; Montévil & Mossio 2015; Mossio & Bich 2017). Historians have expanded this narrative. On the history of the notion of organization, cf. Cheung (2006, 2008, 2010), Toepfer (2009), Duchesneau (2018), Michelini et al. (2018), Riskin (2016), Corti (2022).

the explanatory power of the framework (Bich & Bechtel, 2021) —suggests its further development.

Premised on a distinct understanding of “organization”, proponents of the OA conceptual framework maintain that it is able to “adequately naturalize teleology and normativity” (Mossio et al., 2009, p. 816; cf. also Mossio & Bich, 2017, p. 3ff.; Moreno & Mossio, 2015, p. 63 ff., Saborido & Moreno, 2015). This is one of the central tenets of the OA model and, advocated by proponents since its earliest formulations, has been one of its most hotly debated issues (Artiga, 2011; Artiga & Martinez, 2016; Garson, 2016, 2017, p. 97ff, 2019, p. 47ff; Mossio & Saborido, 2016; Mossio & Bich, 2017)⁴. However, at a conceptual level, important aspects of this key OA claim still need to be clarified. This is particularly the case, I will argue, with regard to what can be considered the core insight guiding the OA strategy for naturalizing biological normativity: namely, establishing a conceptual connection between organization and normativity. This fundamental theoretical move has not yet been adequately isolated nor have its implications been sufficiently discussed. This paper aims to highlight the content of this insight and test its force, putting pressure on some interpretations of it⁵.

Starting from the OA’s general view on naturalizing norms, I will focus on a key question: *how* does the OA approach *conceptually link* its distinct notion of “organization” to normative (teleological) ascriptions? More specifically: by *what argument* does the OA connect its descriptive views on organization to claims regarding norms or “oughts” involved in organization itself?

So far, the OA strategy for answering this question has rested upon a particular kind of counterfactual argument in which the notions of “existence” and “conditions of existence” play a central role, as they are constitutively evoked to ground normative ascriptions. It is this argumentative move, I argue, that needs further scrutiny. In its most simple and introductory formulation, the OA maintains that close consideration of the *conditions of existence* of self-determined organized beings indicates what they *ought to do* on the grounds that “otherwise the system would cease to exist” (Mossio & Bich, 2017, p. 17; Mossio et al., 2009, p. 825; Saborido & Moreno, 2015, p. 84; Saborido et al., 2011, p. 584). This counterfactual argument regarding conditions of existence—expressed in the clause “otherwise the system would cease to exist”—is pivotal to the OA and is central to the broader tradition of autopoiesis more generally (Di Paolo, 2005, p. 453)⁶. For our concerns, it is crucial to underscore that, in the eyes of OA theorists, it not only *conceptually justifies* normative ascriptions but moreover does so in an *objective* (i.e., observer-independent) way. Indeed, according to the OA’s proponents, normative ascriptions are not external or “observer-dependent” precisely

⁴ Other elements of the OA approach are also widely discussed, including its basic metaphysics (Meincke, 2019), compatibility with other frameworks such as teleodynamics (García-Valdecasas 2022), and forms of naturalism (Moosavi, 2019, 2022).

⁵ In fact, though the question of normativity is embedded in the very notion of “autonomy”, there has been little treatment of the topic of organizational normativity. A full-fledged systematic OA theory of normativity has not yet been developed. This paper—which critically explores a different route to organizationally accounting for the phenomenon of biological normativity – will develop some reflections contributing to that line of inquiry.

⁶ As Di Paolo notices, the clause “‘Otherwise it disintegrates’ is the phrase that often follows in the primary literature (e.g., Maturana and Varela 1980, p. 98)” (Di Paolo 2005, p. 453).

“because they appeal to the conditions of existence of a living organization” (Saborido & Moreno, 2015, p. 88, my emph.).

In fact, “conditions of existence” play a central theoretical role in the whole OA approach, which distinctly defines biological organization as *maintaining its own condition of existence* in a specific way.⁷ Yet though references to “conditions of existence” are ubiquitous in the model, this notion has not been explored in detail⁸.

In this paper, I will put this idea under a critical lens, contending that nothing in the notion of a *condition of existence* as it is used by the model makes the argumentative move from conditions of existence to normative ascriptions conclusive—at least when the argument is understood, as most theorists seem to do, as expressing a form of direct entailment. In particular, the idea that an organizationally closed system provides its *own conditions of existence*, a key concept for the model, is not a premise that enables normative considerations. Thus, the whole OA argument for grounding normativity is underpinned by a flawed assumption, namely that a robust counterfactual argument regarding factual, causal conditions of “existence” can in some way straightforwardly ground normative ascriptions. The argument therefore needs to be rethought—or an entirely different conceptual strategy must be adopted to capture the connection between organization and norms.

To demonstrate this, I will proceed in three steps. First, I will outline the main concepts and tenets of the so-called OA conceptual framework to give an overview of its basic theoretical notions (“process”, “constraints”, “dependence among constraints”, “closure”) and identify how it spells out the idea of “conditions of existence”. I will discuss the concepts that are most relevant for my argument and critique—especially “dependence” and “closure,” which are key to determining what “condition of existence” means for the model. Second, I will focus on the counterfactual premise of the argument offered by the OA: i.e., the idea that a system “provides its own conditions of existence” (spelled out via the notion of “closure”) and that, if these conditions are not met, the system would “cease to exist” (Mossio & Bich, 2017; Mossio et al., 2009). I will clarify the nature of this conditional argument as it is understood in the framework, scrutinizing its implications. Then I will discuss the kind of normative conclusions the OA purports to draw from it, illuminating how the counterfactual is used to ground its normative ascriptions. I will explore various possible interpretations of the argument, showing how—after the terms at stake are clarified—it ultimately fails. Third, I will argue that this constitutes a deep problem for the OA model, one profound enough to threaten its whole naturalising strategy. This, I conclude, pushes us look for alternatives: OA proponents need a different route for linking normativity and organization. Other options are open, I argue, such as a stipulational strategy, which, however, needs further elaboration in order to be convincing. Over the course of my argument, I will connect my views to some well-known criticisms that have already been leveraged against the OA—such as the so-called liberality argument

⁷ “Biological organization determines itself in the sense that *the effects of its activity contribute to establish and maintain its own conditions of existence*”(Mossio & Bich 2017, 1 my emph).

⁸ Whereas one might argue that the notion “condition of existence” is not essential to grasping the descriptive import of the OA (in which other notions, such as “closure” or “dependence,” are more essential), it is crucial when it comes to norms: as we will see, the model’s entire argument for naturalisation – and the presumed “objectivity” of norms – *constitutively* hinges upon this idea.

(Garson, 2016, 2017, 2019) —to show that the conceptual foundations of these criticisms, and what gives them theoretical traction, is best understood as evidence of my point about the models’ problematic attempt to directly draw normative conclusions from a counterfactual argument about conditions of existence.

2 The conceptual structure of organization: “constraints”, “dependence,” and “closure”

The general view animating the OA is that some systems—especially living ones—are distinguished by the characteristic of “autonomy” or “self-determination” (Moreno & Mossio, 2015, p. 1). Notably, proponents of the OA maintain that biological self-determination should not be regarded as a generic circular, processual chain of transformations or as a simply “operational” kind of closure—typical, for instance, of input–output circularity (Bich, 2016; Mossio & Bich, 2017, p. 3). Rather, they argue that self-determined beings instantiate a distinct kind of structural regime, or specific kind of “organization,” called “organizational closure” or “closure of constraints”. This property, the main theoretical innovation of the OA, is in turn defined via two fundamental notions: “process” and “constraint”. These two notions are the theoretical building blocks of the framework, and their conceptual distinction is understood to be what distinguishes the theory with respect to the early models of autopoiesis (Moreno & Mossio, 2015, ch. 1; Montévil & Mossio, 2015; Bich & Mossio, 2011; Mossio & Saborido, 2016).⁹

According to OA theorists, the framework’s key notions can be defined as follows: *processes* are “the whole set of changes (typically physical processes, chemical reactions, etc.) that occur in biological systems and involve the alteration, consumption, production and/or constitution of relevant entities” (Montévil & Mossio, 2015, p. 182). *Constraints*, on the other hand, are elements of an organized system that play a specific *role*: they act upon a given process (i.e., exert a causal impact on it) but maintain a certain degree of independence with respect to the process itself during the relevant time scale (in which the process occurs). Thus, constraints are considered elements that enable the occurrence of a process but are “not altered by (i.e. [are] conserved through) that process at the scale at which the latter takes place” (Montévil & Mossio, 2015, p. 182)¹⁰.

The paradigmatic example commonly used to illustrate the notion of “constraint” is the metabolic process, i.e., a process in which enzymes prompt catalytic reactions¹¹. Considered at the right level of description, enzymes can be understood to play a

⁹ The ideas of process and constraint are seen as building upon and improving Robert Rosen’s distinction between efficient and material causes (Rosen, 1991). These views differentiate the OA from other frameworks, which for instance understand “cohesion” as the key notion for identifying individual organized entities (Christensen & Bickhard, 2002).

¹⁰ There is also a further specification of the role of “constraint” in terms of symmetries, which I will come back to in a moment.

¹¹ The model is notably inspired by intuitions found in Kauffman (1993) and Rosen (1991). The notion of “autocatalytic set” is important to the conceptual elaboration of the model and can be considered a foundational example (Bich & Mossio, 2017, Moreno & Mossio, 2015, p. 47ff., Montévil & Mossio, 2015). The other example often referred to is blood circulation, which I will not focus on here.

causal role in the processes of particular chemical reactions (i.e., enable those reaction to occur) without being “consumed” or “altered” by them. In this sense, they *constrain* the chemical process in a generative way.

The notion of “constraint” can be further specified in a way that is relevant for the model (and for our discussion of the nature of the counterfactual argument regarding norms). First, this definition of constraint is always relative to a particular timescale: in order to be identified as constraints, elements must not be altered during *the time in which the relevant process occurs*. This means, for our example, that enzymes might dissolve over the course of a longer time scale but that, considered “from the appropriate viewpoint” (Ibid., 182), they remain unaffected during the reaction they catalyze¹². Second, entities that play the role of constraints are understood to be “acting” causally on “the underlying, far from thermodynamic equilibrium, flow of energy and matter” (Mossio & Bich, 2017, p. 3). The use of the word “act” and causality involved in the definition of this role of constraint is worth further attention. To better clarify it, proponents of the OA formalize it in terms of symmetries and asymmetries. The presence of a constraint “influences” a reaction (i.e., catalysis), they argue, in a way that generates asymmetries if compared with a context in which the constraint is absent¹³. In fact, as OA theorists acknowledge, the notions of “asymmetry”, “influence,” and “causation” are hardly equivalent and have different explanatory implications. OA advocates are aware of this difference (Montévil & Mossio, 2015, p. 182 fn. 7) and want to retain a stronger sense of the “causal influence” exerted by a constraint, so that *ex hypothesis* the model establishes that a constraint “exerts a causal power” (Ibid.).

With these notions in play, the framework is further enriched via the concept of “dependence” among constraints. Metabolic reactions and enzymes are again considered paradigmatic in clarifying this idea: enzymes act as *constraints* in relation to some kinds of processes but are themselves produced by the organism through processes which require the presence of *some other element* playing the role of constraint. In short,

They act on processes (enzymes catalyse reactions) and, at the same time, they are produced by other efficient causes (enzymes are produced by other metabolic processes within the cell) (Mossio & Bich, 2017, p. 14 fn 15)¹⁴.

¹² One might then ask what the *appropriate viewpoint* is and how to determine it. This is not unproblematic and depends on the observer’s explanatory goals. I will not enter into the epistemology of the framework (cf. Bich, 2012, 2021) in this paper. According to the standard view, the “appropriate viewpoint” is the characteristic time of the target process, which provides the relevant time scale to assess the role of items involved.

¹³ “There is an asymmetry between a chemical reaction when considered under the influence of an enzyme (A_C-B_C) and when not (A-B) since, typically, A_C-B_C occurs faster than A-B” (Montévil & Mossio 2015, p. 182). As OA theorists note, the reaction will also occur in the *absence* of the enzymes, but with a speed that would make it ineffective for the generation of the relevant organizationally closed structure.

¹⁴ For a closer description of the other constraints involved, cf. Montévil & Mossio (2015), 184: “Let us consider the production of an enzyme. As discussed above, an enzyme acts as a constraint on the reaction it catalyses. In turn, enzymes are themselves produced by and within the cell, through the translation process: ribosomes build the primary sequence of the future protein on the basis of the messenger RNA (mRNA) sequence, without consuming it. Since the ribosomes and the mRNA play a causal role while being conserved during this process, they both act as constraints (at a specific time scale) on the production of the enzyme. Consequently, the relationship between the enzyme, the ribosomes and the mRNA can be

Enzymes are thus exemplary for the organizational paradigm since they illustrate how “constraints” can “depend on” each other.

Such cases involve a particular notion of *dependence among constraints* that obtains when entities produced by constrained processes play the role of constraints in subsequent processes. This dependence is *direct* when production of a constraint is directly influenced by another constrained process (for more on this, cfr. Montévil & Mossio, 2015, p. 186ff. and Moreno & Mossio, 2015, p. 19ff.). In those cases, constraint C_1 enables a process in which constraint C_2 gets produced.

It is worth lingering a moment here to focus on how relations among constraints are conceptually spelled out by OA theorists, since this is relevant not only to understanding the metaphysics and explanatory import of the framework but also its claims about teleology and norms. In particular, it is important to note that the conception of “dependence” as a “causal role” involves introducing two other concepts. First, the OA advances the view that constraints thus understood are *enabling conditions* (or ‘enabling constraints’ Moreno & Mossio, 2015, p. 49). In other words, a constraint “enables the maintenance of other constraints” (Ibid., my emphasis). Second, and most importantly, this idea of dependence is often expressed as the claim that constraints are the “conditions of existence” for other constraints (Bich, 2016, p. 204ff.). The language of “conditions of existence” is particularly important here, since it is used extensively by the OA (Saborido et al., 2011, p. 584; Mossio-Bich, 2017, p. 16; Saborido & Moreno, 2015, p. 88) and plays a pivotal conceptual role in OA insights on the naturalisation of normativity and teleology—to the extent that a good part, if not all, of its argument for naturalization hinges upon it.

I will come back to this point. For the moment it is sufficient to notice what this talk of “conditions of existence” amounts to: sometimes expressed as the idea that constraints “presuppose” each other (Saborido & Moreno, 2015), the idea of “conditions of existence” points to a relation of *causal dependence* or *causal influence* among constraints—which is specified via notion of asymmetry. Thus, when OA theorists claim that some constraints are the *conditions of existence* for some other constraints, they mean that the former exert a distinct form of *causal influence* enabling the existence of the latter (I will return later to the question of whether “existence” here should be considered equivalent to “generation,” “presence,” or “maintenance”). Notice also that the fact that the only notion at play in this understanding of condition is “causal dependence” is what makes the whole model so appealing from a *naturalistic* perspective.

Once this set of basic notions is defined, the core concept of OA theoretical model comes into view, namely the idea of “organizational closure” or “closure of constraints”. According to the framework’s proponents, closure is a property of a system in which.

the existence of each constraint depends on the existence of the others, as well as on the action that they exert on the dynamics. In this kind of situation, the set of constraints realizes self-determination as organizational closure. (Mossio & Montévil, 2015, p. 181)

Footnote 14 continued

pertinently described as a dependence between constraints (in which the enzyme depends on both ribosomes and mRNA), insofar as all these entities satisfy the definition of constraint at specific time scales, which are considered jointly.”.

When constraints collectively contribute to the maintenance of the system, and each constraint depends on at least one other constraint, there is closure¹⁵. In this regard, metabolic reactions are again paradigmatic:

Metabolic organization consists of a network of reactions, finely regulated by their highly complex material components (enzymes), and regenerated by the very network that they control in an organizationally closed way. (Mossio et al., 2009, p. 827)

According to the OA, “closure of constraints” is the hallmark of biological systems at various scales (Mossio & Montévil, 2015, p. 187). Organisms are autonomous in that they exhibit the structure of systems characterized by the “mutual dependence of internally produced constraints” (Bich & Bechtel, 2021, p. 53). It is this idea that supports the hypothesis that “closure defines biological individuality” (Moreno & Mossio, 2015, p. 23). Put into the language of *conditions of existence*, the idea of mutual dependence among constraints gets expressed by the OA as follows: constraints in biological systems are *conditions of existence of each other* (Bich, 2016, p. 5)¹⁶.

This framework has been stressed as having many theoretical advantages over different (and earlier) conceptions of biological autonomy. One of the model’s strongest points is that it enables us to distinguish between *closure* (at the level of constraints) and *interaction* with the environment (understood as *openness* at the level of processes). This is possible because,

While biological systems are (by hypothesis) closed at the level of constraints, they are undoubtedly open at the level of the processes, which occur in the thermodynamic flow. Autonomous systems are then, in this view, *organizationally closed* and *thermodynamically open*. (Moreno & Mossio, 2015, p. 6)

Interactive openness is another basic feature of such systems that coexists with closure and is considered characteristic of living systems (cf. Arnellos & Moreno, 2016).

As I noted in the introduction, this model has been seen as capable of spelling out the idea of autonomy in a new, viable way and is still being elaborated. One of the central tenets of the model since its early stages of development, and one of the key contributors to its success, is its claim to provide a model for naturalising *functionality* and *normativity*. Proponents of the OA approach have defended the idea that functional attributions and their normative import in biological systems are best accounted for in terms of the roles different elements play within regimes of organizational closure (Moreno & Mossio, 2015; Mossio & Bich, 2017; Mossio et al., 2009). This has granted the model an important position in the scholarly debate on functions (Garsons, 2016,

¹⁵ Moreno & Mossio (2015), xxix. Montévil & Mossio (2015, p. 181) define “organizational closure in terms of the mutual dependence which exists among a set of entities that fulfill the role of constraints within a system”.

¹⁶ It is worth noting that for some theorists “closure” – i.e., the idea of mutual conditions of existence – is a necessary but not sufficient condition for talking about autonomy (Moreno & Mossio 2015). I will not dwell on this point since it is not relevant for analysis of the counterfactual argument I am focusing on here. However, it is worth keeping in mind when looking for alternative strategies for linking autonomy and normativity that do not rest on the counterfactual. I thank an anonymous reviewer for pushing me to clarify this point.

2019)¹⁷. As mentioned above, however, a basic feature of the core argument underlying these attributions has yet to be carefully scrutinized: how the OA conceptually links the account of closed organization just outlined with claims about normativity and purports to derive the latter from the former. In what follows, I will analyse this claim in relation to the model's conceptual distinctions.

3 Naturalising norms through “conditions of existence”: Organizational difficulties

Since normativity is one of the most highly discussed topics in a wealth of contemporary debates, it is worth briefly discussing its meaning and attempting to define it in a way that is relevant to this discussion. At a general level, normativity entails both an evaluative dimension (judgements about “goodness” and “badness”) and a dimension of correctness (judgements about “rightness” or “oughts”) (Finlay, 2009, 2010)¹⁸. It is the second meaning that is at stake in OA discussions of functionality, which tend to focus on a familiar issue: namely, the idea that a good account of functionality must be capable of determining how a certain trait or item *ought to work* and of conceptually distinguishing such an *ought* from *how it actually or factually works*¹⁹. Some scholars formulate the question of normativity as the idea “that it’s possible for a trait to have a function it cannot perform, that it can dysfunction or malfunction” (Garson, 2019, p. 11; cf. also Garson, 2016, p. 6). However, this amounts to saying no more than that a good theory must be able to conceptually determine what a given trait *ought to do* (in terms of “rightness” or “correctness”). In this sense, “normativity” is a familiar sub-heading and defines a strain of the debate on biological functions.

How does the OA claim to account for such normative ascriptions? Notably, taking the above-mentioned framework as their point of departure, OA theorists defend the view that the function of a trait should be identified in terms of the role it plays in self-maintaining, organizationally closed systems. In short,

Closure is then what grounds functionality within biological systems: constraints do not exert functions when taken in isolation, but only insofar as they are subject to a closed organization. (Mossio & Montévil, 2015, p. 186, my emph)

¹⁷ Discussions of OA thus far have involved a set of objections, including the so-called liberality objection as well as objections related to cross-generational functions (cf. Artiga 2011; Artiga & Martinez, 2016; Garson, 2016, 2017, 2019; Mossio & Saborido, 2016, Mossio & Pontarotti, 2019; Bich & Mossio, 2011; Mossio & Bich, 2017; Mossio et al., 2016).

¹⁸ For the sake of my argument, I will stick to this familiar distinction and keep the two understandings of normativity separate, though I am aware that the distinction is problematic and somewhat artificial. In the debate on functions, for instance, various scholars have argued that “oughts” of certain traits can be determined only by referring to particular sorts of values or “goods” (for instance what is “good” for the bearer of the traits). For some of these theorists, the dependence linking the two dimensions is so strong that ought-normativity necessarily entails an appeal to axiological-normativity, such as notions of “good” (Bedau, 1992; McLaughlin, 2001), for instance, or of “benefit” for the organisms (Deacon & Cashman, 2013; Garcia-Valdecasas, 2022).

¹⁹ Another way of putting this is to say that a good account should enable us to capture the difference between “having a function” and “functioning as”. Inability to capture this distinction has famously been one of the main criticisms faced by various accounts of functions.

Given such claims, the question I want to focus on is the following: Why is *closure* necessary to attribute functions to a given constraint? Or, put differently, what is it *about* closure that enables it to determine what something “ought to do”? What precisely is the argument that moves us from closure to normative ascriptions?

Looking at how the OA answers these questions foregrounds what can be regarded as the basic insight grounding the whole OA strategy: the idea that functional and normative ascriptions (what an item “ought” to do) derive their justificatory force from the fact that the performance of constraint is essential for the *very existence* of the organization. To use a standard formulation employed by its proponents: “the system must behave in a specific way, *otherwise* it would cease to exist” (Mossio & Bich, 2017, p. 17; Mossio et al., 2009, p. 825; Saborido & Moreno, 2015, p. 84; Saborido et al., 2011, p. 584)²⁰. This intuition, found in various claims expressed by its advocates, underpins the whole naturalising strategy of the OA and usually appears in the form of a counterfactual argument maintaining “that specific organization would not exist without T” (Mossio et al., 2009, p. 825) or that “biological organization could not exist without the causal action of constraints” (Montevil & Mossio, 2015, p. 184).

According to this line of reasoning, what grounds functionality and normativity is the “very existence” of the system and its parts (Moreno & Mossio, 2015, p. 70). More precisely: normative and functional ascriptions derive their justificatory force—and their objectivity—from a core counterfactual argument regarding the “very existence” of the system.

Upon closer scrutiny, this argument is an *implication* of a counterfactual premise. The structure appears to be the following: given the closed, mutually generative interdependence of constraints realized by closure, *if* one constraint stops performing its role, *then* the whole organizationally closed, self-maintaining system will “cease to exist”. *Therefore*, the element ‘ought to work’ in a certain way.

This reasoning is most often presented as direct and straightforward, and the intuition behind the formulation seems appealing. The idea of mutual interdependence of parts is also central for the framework’s interpretation of the notion of “inner teleology”. But is this line of reasoning correct? Before discussing this issue, let me emphasize the peculiarity of this argumentative strategy by comparing it with another, alternative strategy for naturalising functionality and normativity, namely the ‘selected effects theory’²¹. The (highly controversial) claim sustaining the selected effects view is that what *grounds* ascriptions of functionality and normativity is the notion of “selection”. The insight underwriting this strategy is that selection determines the difference between something performing some activity, on the one hand, and something having a function, on the other. This in turn involves consideration of how an item “ought to” work. At a conceptual level, the force of the selected effects argument seems to

²⁰ I think use of the word “must” is infelicitous, since the kind of necessity expressed is conditional, not absolute. It would have been more apt to say that the system “ought” to behave in a certain way (it still could, from a relevant point of view, *de facto* behave differently). I will discuss this in a moment.

²¹ For my purposes it is sufficient to rely here on a very general understanding of the selected effects theory, without entering into its various versions or the wide debates around them (for an overview, cfr. Garson 2016, 2019; for a recent defense Bourrat 2021). In fact, even if it is not advocated by any theorists in the simple form I present here, the argumentative claim I outline encompasses its scope. Moreover, it is mentioned here only as a means of comparison.

reside in the intuition that the factual *explanatory* work performed by selection can also be relied upon to justify *normative* attributions. “Ought”-attributions derive their rational justificatory force from the explanatory significance of selection, so to speak. This is, of course, a very contentious claim, and many theorists reject it by arguing that nothing in the notion of selection—which is a fact and can be interpreted in fully causal terms—justifies attribution of normative properties (cf. Davies, 2001)²².

In the case of the OA, what *bears the justificatory weight of underwriting functional attribution* is not “selection” but the notions of “existence” and “conditions thereof”: reference to *existence* grounds normative ascriptions via the above-mentioned counterfactual argument. Additionally—and this is a separate point to which I will return later—OA theorists hold that, since the premise appealing to the notion of existence (“otherwise it would cease to exist”) is counterfactual, such ought-ascription is granted *objectivity*. In other words, the counterfactual is assumed to provide an objective, “non-arbitrary” (Mossio et al., 2009, p. 824) or non “observer-dependent” way of ascribing oughts (Saborido & Moreno, 2015, p. 88)²³.

At this point, one could ask whether “existence”, understood organizationally, is a property by which one can conceptually ground normativity (especially via a *prima facie* conditional argument). My answer will eventually be “no” —at least if one wants to derive normative implications logically by reference to a counterfactual. To defend this position, I will support the idea that, though closed organized systems have *specific objective, counterfactually robust conditions*—and this specificity can be spelled out in terms of an explanatorily relevant collective dependence among constraints—there is nothing special about these conditions (or about the existence of the organized being in itself) that justifies attributing them normative properties. Although it is correct to say that organisms are *explanatorily special*—in that they instantiate a particular kind of causal dependence, namely closure—this does not mean they are *normatively special* or involve any *special* normative features straightforwardly derivable from their organizationally closed forms.

To bring this into view, I will analyse the OA notion of “dependence” and the kind of counterfactuals it licenses. First, I will show that nothing in the counterfactuals derivable from the idea of “simple dependence” implies normative properties. Second,

²² Davies admits that functional attributions involve distinct kinds of expectations and forward-looking aspects that could be considered “normative”. This, however, is not the sense of “normative” at play here. Regardless, as will become clear, from this forward-looking aspect I will develop a similar objection related to the notion of “existence” and its conditions.

²³ The OA appeal to the existence of an individual system involves some key differences from the selective account, which does not focus on the existence of a single organized *individual* but rather the survival of a historical series of individuals over time. Thus, in most of its versions, the selective approach does not involve appeal to counterfactual reasoning of the form used by OA (selectivists do not need for something to have an “ought” without which “the system would cease to exist”). Rather, it is sufficient for the item to be an instance of a kind that has been subject to selection. This means that the argument “if X does not perform Y, the system would cease to exist” not only has less traction but also is not needed. One consequence of this view often considered an advantage is that it can ascribe “oughts” to things that do not directly contribute to an individual’s organization (cf. cross-generational traits). On the controversy regarding this point, cf. Artiga (2011); Artiga & Martinez (2016); Garson (2017, 2016, p. 97ff., 2019, p. 47ff.); Mossio & Saborido (2016); Mossio & Bich (2017). I will not enter into the details of the various selectivist approaches, which are diverse and far from being immune to criticism.

I will show that the same applies to the particular kind of dependence defined as “closure”: nothing in this notion has normative consequences.

(1.) *Simple dependence.* As we saw in Sect. 1, the idea of a *condition of existence* is first introduced by the OA in relation to the notion of “dependence,” through the claim that a constraint (C_1) is a *condition of existence* for another (C_2). In that context, saying that C_2 depends on C_1 does not amount to saying anything other than that C_1 has a *causal role* that enables the process producing C_2 . This condition—like the notion of dependence to which it is tied—is explicitly defined in *causal terms* (“a causal influence on the condition of existence of” another constraint, cf. Mossio & Bich, 2017, p. 11) with the help of asymmetry.

What kind of normative implication can we derive from these concepts? To clarify the conclusions we can (or cannot) draw from a counterfactual argument that appeals to the causal conditions of existence in this way, let us consider the following:

P (1) The necessary causal condition for the existence of rain is that the sun appropriately warms the body of water W.

C (1) Therefore, if the sun does not appropriately warm the body of water W, rain would not exist.

C (2) Therefore the function of the sun (what it “ought to do”) is to appropriately warm the body of water W.

This argument would be wrongheaded, since, based on a robust counterfactual statement regarding the (objective) causal condition of the existence of X (*rain*), it draws a conclusion about those conditions involving a normative property. Few people would be ready to accept that conclusion and argue that the sun—*qua* causal condition—“ought to” warm the water, *because* otherwise a certain outcome (rain), or a certain network of events (the water cycle), would not exist²⁴.

The reason this example is relevant for our purposes is because, at the appropriate level of abstraction, the sun can be read as a *constraint* (it enables a certain process—rain, or the water cycle—to occur, without being affected or altered by them). In this case, the constraint is of course *external* to the process, and the relation of *dependence* between the two phenomena is one of simple rather than closed dependence. Nonetheless, the case clearly foregrounds how, at this level of abstraction, causal conditions of dependence are *neutral* with respect to normative ascriptions—and that no argument about factual causal conditions can be used to draw normative conclusions. There is nothing in the notion of “condition” or “dependence” as presented by OA that enables such a logical step. The conclusion we should draw at this point seems to be that the notion of “dependence” *alone* does not underwrite any normative attribution.

²⁴ I will not enter into the details of how the relevant counterfactual should be interpreted, as my argument does not depend on any particular interpretation of it. Any theory of counterfactuals (in terms of possible worlds, for instance) could be used to interpret the argument (cf. Lewis, 1973; Mackie, 1974). Woodward’s idea of spelling out causal conditions via counterfactuals seems particularly apt for grasping the intuition behind the OA argument (Woodward, 2001, 2005). However, that interpretation does not support the OA claim about norms. There are current accounts of biological teleology based on Woodward’s idea of counterfactual explanation that do ground normativity (Moosavi, 2022; Walsh, 2012), but they differ from the strain of the OA I am discussing here.

Rather, mistaking a robust counterfactual argument for the existence of X as entailing *ipso facto* normative consequences appears to lead to odd normative ascriptions²⁵.

(2.) *Closed dependence*. Given this conclusion, one might turn to *closure* as the property enabling the inference of normative ascriptions. Maybe—one could argue—only a relationship of *closed* dependence (rather than of simple dependence, as in the previous case) can logically yield normative ascriptions. If so, in this case—where dependence is mutual and generates *closure*—*something special* would enable the conceptual transition from a counterfactual statement to normative attribution.

It seems reasonable to expect closure to perform that work, since it is the conceptual innovation of the OA model. Closure is the property in terms of which one should ultimately understand the notion of biological “self-determination”, which is key to grasping teleology, and according to OA theorists, closure is the characteristic that enables us (in principle) to distinguish living systems from non-living ones. For instance, the OA notably rejects idea that the water cycle manifests closure (as suggested by Toepfer, 2012), because closed systems manifest a particular property: they generate and maintain their *own internal constraints*. Therefore.

Unlike a closed organization ... the chain of transformations [of water cycle, L.C.] *does not generate its own constraints*, which are external to the circular dynamics, and independent from them (Mossio & Bich, p. 7).²⁶

Put differently: closure is the property of systems that generate “(at least part of) their own conditions of existence” (Moreno & Mossio, 2015, p. 80; Bich, 2016, p. 4).

Given this definition, one might ask: How does the additional premise that the causal conditions for existence of an entity are “internally generated” rather than “external” affect the core argument for norms? How does the fact that the existence of X involves a relationship of *closed mutual dependence* (rather than *simple dependence*) modify the argument to the extent that the clause “otherwise X would cease to exist” enables normative ascriptions?

The argument envisioned by the OA might be expressed along the following lines:

P (1) The necessary causal condition for the existence of C_2 is that C_1 appropriately enables a process ϕ_1 to occur in a way that generates C_2 ;

P (2) The necessary causal condition for the existence of C_1 is, in turn, that C_2 appropriately enables a process φ_2 to occur that (eventually, via a chain of dependences) generates C_1 ;

C (1) Therefore, if C_1 does not appropriately process ϕ_1 , C_2 would not exist (and neither would C_1), and vice versa.

C (2) Therefore the function of C_1 (what it “ought to do”) is to appropriately enable the generation of C_2 , and vice versa.

²⁵ To clarify, I am not arguing this is what the OA claims. The example foregrounds the conceptual implications enabled by the OA notion of “dependence”, as well a form of reasoning that, I will argue, does not change even when the dependence is closed and “internal” to the system.

²⁶ “The conditions of existence of the water cycle are met *independently from the causal action that it possibly exerts on its own boundary conditions* (i.e. the external constraints): the water cycle would exist even though the river did not modulate its own bed” (ibid, my emph.). Cf. also Mossio et al. (2013).

Although “mutual dependence” certainly marks a key difference at the descriptive level²⁷, this does not seem to be a *relevant* difference at the level of normative implications. In fact, at their core the relationships of dependence involved in closure remain causal. And the new “irreducible properties and causal powers” emerging with closure do not exhibit any specific *intrinsic* normative significance. The conclusion C2 thus seems to be unwarranted. The conceptual point raised above regarding the problematic transition from a simple concept of “dependence” to a normative concept of “norm” (by appealing to the notion of existence) therefore seems unaffected: there seems to be no sufficient reason to take an argument mentioning a list of factual causal (internal) conditions of existence for X as *ipso facto* underwriting normative ascriptions regarding those conditions (what they ‘ought’ to do) *based on the idea* that “otherwise X would cease to exist”.

This critical point regarding the scope of the counterfactual argument is independent of the difference between “internal” causal conditions generated within the system (i.e., enzymes generating a closed network) and “external” causal conditions operating outside the system (i.e., the sun generating the water cycle, so to speak, from without). Formulated in this way, there is no principled difference between the two: both try to derive *normative* implications from a *factual* statement regarding the causal conditions of existence for something. The criticism therefore applies to both types.

Pushing this point, we could say that the OA jumps too quickly from the identification of “internal” causal conditions of existence to the conclusion of “intrinsic” objective normative standards. Yet “internal dependence” and “intrinsic norms” are two different concepts, and counterfactual arguments regarding the first are not *ipso facto* good arguments for the second. On the basis of these observations, one is tempted to draw the conclusion that appealing to the fact that conditions are “internal” or “organizationally closed” does not seem sufficient to perform the justificatory work assigned to it. There is nothing *special* in closure enabling normative ascriptions, at least via the standard counterfactual reasoning provided by most OA.

The question then remains open: what is it about the *existence* of a closely organized being that (unlike a non-organized one, such as “rain,” or a not closely organized one, such as a “water cycle”) statements about its causal conditions license normative “ought” implications? Why would the counterfactual argument according to which “if some conditions are not met, then a system would, so to speak, ‘disappear’ from the furniture of our universe (or, perhaps, not even come to existence)” produce normative implications for organized systems and not for non-organized ones?

In response to this pressure, one might argue that, even if there is no strictly *logical* connection between conditions of existence and “oughts”, there might be *some other ground* by which we rationally derive the latter from the former—for instance, by appealing to the *explanatory import* played by the notion of “conditions of existence” in the framework. It is this general strategy that has been adopted by some selected effects theorists. Remember that in the simplified version of the selected effects theory outlined above, it is the *explanatory work* of selection that performs the justificatory

²⁷ It enables the emergence of some “distinctive and irreducible properties and causal powers” (Moreno & Mossio 2015, xxx).

heavy lifting of underwriting normative ascriptions (since selection *explains* a particular type of performance X, then it is reasonable to think X is what ‘ought’ to be performed). Similarly, one might argue that in the OA model it is the notion of *conditions of existence* that performs the *explanatory* work. In fact, OA accounts respond to the explanatory question “why is X there?” by providing a set of conditions of existence for X which involve closed organizational dependence (cf. for instance Mossio et al., 2009, p. 825).

However, since these “conditions of existence” are spelled out in entirely causal relational terms—as relations of causal dependence, formalized as asymmetries—the *form* of this explanation, even in the case of a closed system, is entirely causal²⁸. Thus, even if there are ways to account for the relevant causality via counterfactuals and argue that these counterfactuals are not only descriptive but also *explanatory* (Walsh, 2012; Woodward, 2001, 2005), this does not put us in a better position for justifying normative ascriptions.²⁹ “Conditional explanations”, understood as giving an account for the causal conditions for something to occur, do not per se imply normative consequences (cf. Reiss, 2005)³⁰.

In our initial formulation of the problem, we were looking for something *specific* or *distinct* about the relations of organizationally closed systems that conceptually enables normative ascriptions. Upon closer inspection, however, this special element cannot be found: what exactly do the appeal to *closure* and counterfactual clause “otherwise cease to exist” aim to capture? What is *special* about the “very existence” of organisms that makes their disappearance (and the counterfactual conditions for it) normatively significant, with respect to the case of, say, *rain*, which does not involve normative ascriptions? Without a clear answer to this question, the OA strategy of grounding ascription of functionality and normativity on *conditions of (organizationally closed) existence*—based on the idea that oughts make a “specific contribution to the conditions of existence of the whole organization” (Mossio et al., 2009, p. 826), such that the “the organization itself would cease to exist” (Ibid, p. 829)—seems unfounded.

4 Existence, generation, maintenance

To get a better handle on the above-mentioned question—and look for possible responses—one might try to qualify the notions of “existence” at play. In fact, OA accounts often use these terms in a non-regimented way that can result in some ambiguity. Two questions are fundamental in this regard: (1) What exactly does “existence” mean in this context? (2) What are the kinds of items upon which “existence” and

²⁸ This is a central claim of the OA and has been considered an advantage by its proponents, in that it offers a naturalistically manageable conception of organization.

²⁹ This criticism does not apply only to the OA but has also been used to unmask selected effects claims about normativity. The argument is similar: once closely analyzed, explanations appealing to “selection” can be spelled out in entirely causal terms; they therefore imply no aspect of *normativity*. The same applies, I argue, for “closure”.

³⁰ Reiss notably makes this point regarding the conditional explanations at work in natural selection. There is no principled difference, however, in the case I am analysing.

“conditions of existence” are predicated? In this section, I will explore two ways of disambiguating the first point, and two possible answers to the second. This should help to clarify the metaphysical commitments of the OA framework and, more importantly, provide some possible interpretations of the problematic OA-counterfactual argument for normativity.

(1) First, “existence” in the model is often used as a synonym for “generation”. The conditions of existence of a constraint, for instance, are understood as conditions for its generation, and the dependence among constraints are seen as involving a “mutual *generative* dependence” (Bich, 2016, p. 5 ff.). In other words, enzymes are *generated* via a process that is in turn constrained. However, if we substitute the notion of generation for norms at the core of the counterfactual argument (which then takes the form “X ought to work in a certain way, otherwise it would not be generated”), we are no better off. The same applies if one considers “existence” a synonym of “maintenance”, such that constraints are “generated, and are maintained” in the system (Mossio et al., 2009, p. 826). Since in this case the conditions of both “continuous generation” and “maintenance” are accounted for causally, the conceptual problem remains unaltered.

Second, “existence” can be understood in a different sense, namely not as *empirical* existence but at a more “conceptual” level. In this latter sense, claims about existence would be interpreted as claims about “conceivability.”

This interpretation is suggested by OA theorists who contend that closure must be *abstracted* from time and that organization should *not* be considered the dynamic description of a certain process but only as *relational*. Following Robert Rosen, the OA.

naturalises teleology by *abstracting* closure from time, and by considering a purely *relational* description of the circular causal regime, and not a dynamical one, based on temporal sequences of states. All subsequent accounts of closure share, we hold, the very same strategy for naturalisation. (Mossio & Bich, 2017)

This abstract understanding of the framework—which empirically deflates the notions to stick to the idea that it only conceptually describes a “relational structure” (Rosen, 1991, pp. 227, 259ff) —might change the meaning of the terms at play³¹. It is in this sense that the correct synonym for “existence” would be not *generation* but *conceivability*. The whole counterfactual argument would then be translated as follows: the existence of an item (most importantly, a constitutive constraint) is not *conceivable* outside of the context in which closure operates.

In fact, this can be understood as a conceptual and not an empirical point. Still, however, the situation with regard to normative attributions is not improved. The counterfactual argument offered would only take the following form: “X ought to work in a certain way, otherwise it would cease to be *conceivable*”. In this form, the argument appears as question begging. This is because the *conceptual conditions of conceivability* of the elements of the framework are set *ex hypothesis* via definitions (of “constraint”, “processes”, “dependence,” etc.). Secondly, even if “conceivability”

³¹ Rosen called systems of this type neither “machines nor mechanism” and noted they cannot be simulated by finite-state machines (Rosen, 1991, p. 24). He also provides an account of generation (ibid., 154). For a discussion of the relation between organization and mechanism, cf. Bich and Bechtel (2021).

understood in this way sets normative standards, those standards have nothing to do with the specific contents of the concepts at stake. For instance, if one defines “wife” as a relational concept, it follows, one could argue, that in order to be conceivable, the content of wife “ought to” bear relation to the notion of “husband”. (In the same way “mother” is conceivable only with a *generative* relation to “child”). According to some views about the nature of judgement, this indeed involves a kind of normativity. Yet even if the use of such concepts would entail something normative, this sense of conceptual normativity would be very limited: it has to do with the normative aspect implicit in *every* concept application, meaning there would be nothing specific to the case of organizational concepts. It is therefore not the kind of normativity that the OA requires. “Conceivability” does not seem to be a property from which one can derive the appropriate kind of “oughts”.

(2) Regarding the object of normative ascriptions, notice that, so far, I have focused on the “existence” or “conditions of existence” of *constraints*. However, the argument resulting from the conditions provided by the OA refers to the condition of existence of the “whole” organization. It is the whole organization that persists in existing.

Biological organization consists in a network of mutually dependent components, each of them exerting a causal influence on the condition of existence of the others, *so that the whole network is collectively able to self-maintain*. (Mossio & Bich, 2017, my emph.)

That the conditions for the existence of the whole organism do not coincide with those of single constraints is specified by the model via the idea of *regimes* or *configurations* of an organization. This distinction allows OA accounts to distinguish between “indispensable” and “dispensable” traits (Mossio et al. 2009, p. 830; Saborido & Moreno, 2015, p. 88).

There are thus reasons to think that the correct answer to the question “what exactly gets maintained?” is the whole organization, in one of its forms (i.e., one member of the set of possible regimes)³². Also in this case, however, the above-mentioned considerations are still applicable: spelling out some of the *sufficient conditions for something to exist* does not produce any conclusions regarding how the conditions ought to work. Self-maintenance, understood as a form of causal dependence among constraints that can be abstracted from time or not, does not imply normative ascriptions, even in cases where the logical subject maintained is the whole organism.

The conclusion to be drawn from the possibilities considered above appears to be the following: (i.) the conditions *generating* constraint, (ii.) the conditions for *conceiving* a constraint (outside of time), and (iii.) the conditions of maintenance or conceivability of an *organism* all seem unable to justify normative attribution based on a counterfactual claim regarding “existence”.

In all these cases, OA accounts mistake a *good counterfactual argument* regarding the robust objective conditions for the existence (or, alternatively, the conceivability)

³² The presence of second-order constraints complicates the picture, introducing the idea of regulation. I will not address this issue here. As proponents maintain, “biological systems, first and foremost, (self-)maintain their coherence and identity as the closure between their constitutive constraints, which is also regulated by second-order constraints, so as to handle deleterious variations.” (Moreno & Mossio, 2015, p. 89).

of a closed organization for a sound and straightforward argument for the allegedly normative objective properties of that organization. Under closer scrutiny, therefore, the argument is not as conclusive as it seems³³.

5 What is special about the “existence” of organized entities?

The intuition that OA tries to capture via a counterfactual argument taking the form “otherwise the system would cease to exist” seems *prima facie* very appealing. Even if we have now shown that, upon closer scrutiny, there are good reasons to believe the counterfactual argument is not the best way to express the OA intuition about how autonomy generates norms, one might still ask where its initial appeal to this claim comes from.

Two possibilities are worth considering here. First, there may be a further, implicit assumption at work in the OA account, namely the idea that the *existence of organizationally closed systems* has a value *built into itself*. In fact, we generally tend to find the existence of living entities more normatively significant than the existence of inanimate ones. In the case of living systems, we might be inclined to say that existence is something *good*. Some theorists are ready to accept this assumption (McLaughlin, 2001), which could help justify normative ascriptions via counterfactual statements (Moosavi, 2022). Note, however, that this claim is *additional* and must be separately argued for: nothing in the OA conceptual apparatus considered thus far entails this assumption. Closed organizations are spelled out in entirely causal terms. So, if the OA adds claims about their value to its repertoire, it needs to justify them. Furthermore, this injection of “values” *ex hypothesis* into the account notably risks undermining its naturalistic credentials.

Second, some OA formulations, such as “the system must behave in a certain way in order to exist” or “the system maintains specific interactions with the environment” (Moreno-Mossio, 2015, p. 90), seem particularly conducive to normative ascriptions. In fact, interpreted in action theoretical terms, this kind of phrasing attributes a particular form of *agency* to a particular subject (i.e., the system). This kind of vocabulary is ubiquitous in OA descriptions, which talk about systems “doing” stuff to maintain themselves, systems “acting” in certain ways, etc. The very claim that a certain

³³ The impossibility of drawing *direct* normative conclusions from factual conditions seems to be the major (often unrecognized) conceptual point behind much of the criticism of the organizational model so far. Notably, critics have often worked to provide *counterexamples* to the OA. Justin Garson, for instance, mentions the idea of “panic disorder” (Garson, 2016, 2017, 2019) to substantiate what he calls the *liberality objection*, namely the idea that the OA is not able to distinguish relevant cases in which an organizationally closed system normatively “ought” to work in the proper way. Panic attacks – Garson argues – can be conceptualized as organizationally closed (and differentiated) structures, but it is difficult to say that parts of the system “ought” to work in a way to create the attacks. In my view, the gist of this counterexample is elsewhere and cuts more deeply. In fact, like many other objections regarding liberality, it brings into view (and hinges upon) the fact there is *no objective way* to directly move from an organizational description to an *ought ascription*. The conceptual problem regarding the normative ascriptions at stake in the case of a panic attack, I would argue, is not different from the case of “rain” outlined above. Both are cases in which one tries to derive normative ascriptions from causally closed organizational counterfactuals. That these ascriptions are counter-intuitive is a symptom of a bigger issue, namely that one is not conceptually justified to draw *any* normative conclusions.

kind of system must “do” something in order to exist can be interpreted as a form of goal-oriented agency (Finlay, 2019). In fact, the prime domain of application of this action-theoretical vocabulary is human action and the vocabulary is often implicitly associated with intentions and norms, which are built into these expressions. Yet this kind of interpretation cannot be aligned with the OA framework, since there the notion of organization (and of an organism’s interaction with its environment) is spelled out *entirely* in terms of “causal influences”. Translated into the basic categories of the OA, the locution “doing something” contained in the phrase “the system does X” does not *prima facie* involve any kind of intentionality (or normativity) and can be rephrased in entirely causal terms. The same applies to the idea of “doing something in order to exist”, without existence being per se a goal in any normative sense (Reiss, 2005)³⁴.

Similar considerations arise in connection with the idea of “inner” or “intrinsic teleology”, which gets applied by the OA to organized entities. Tied to the notion of closed dependence, the talk about inner teleology is often seen as capable of disclosing normative consideration. Clarifying the connection between teleology and normativity, however, raises the same difficulties already highlighted. More work needs to be done to spell out how the notion of inner teleology can provide grounds for normative ascriptions.³⁵

Once we clarify the terms at stake and the possible misunderstanding they can generate, these formulations seem less conducive to attributions of normativity, and the impression that normative properties can be *directly* or even logically derived from the fact that closely organized beings would disappear from existence if things were “otherwise” vanishes. This seems to suggest that the question of finding a link between is and ought via the notion of organization remains, leaving the challenge of how the OA can naturalize normativity via the counterfactual argument open.

³⁴ In fact, OA theorists also define agency in *fully causal terms*. One of the defining features of agency, they maintain, is its “capacity to generate causal effects” (Moreno & Mossio, 2015, p. 92). However, looking closely at this expression we find it seems to reinstate the problem, since, as shown above, “generation” is itself understood in causal terms. This leaves us with a series of questions about how agency is being defined (would it entail the “capacity to causally produce causal effect”?). However, the OA notion of *agency* is controversial – a point I will not discuss here. Notice only that to define their conception of *agency* proponents of the OA again recur to the notion of “conditions of existence”, which is again explained in causal terms: “By contributing to the maintenance of the closed organization to which they belong, *agential functions contribute to maintaining the conditions of their own existence*; hence, the maintenance of the whole organization can be taken as the naturalised goal of agential functions, and its conditions of existence are the norms of their activity” (Moreno & Mossio, 2015, p. 93).

³⁵ If, upon closer scrutiny, the OA’s talk of “intrinsic teleology” can be entirely translated into causal terms without loss of explanatory import, then one might end up with a quite deflationary interpretation of its normative implications. This would not affect its use within the framework but might offer additional grounds for detaching the idea of intrinsic teleology from the idea of intrinsic normativity. The OA, however, might reply that the idea of “inner teleology” in the organizational framework is broader and involves more than mere reference to regimes of closed dependence – instead implying interactive openness and relation to the environment. The decisive question, however, is to understand how strongly OA theorists want to commit to the idea that all notions belonging to the framework are ultimately causal. I thank an anonymous reviewer for this remark.

6 Conclusions

I have discussed several key concepts of the OA framework in order to reconstruct the claim put forth by proponents that “closure is the circular causal regime that *adequately grounds* intrinsic teleology and, consequently, normativity.” (Mossio & Bich, 2017, p. 16).

I have asked the question: what is it *about* closure that enables such normative “grounding”?

The standard answer to this question is expressed via a conditional argument which hinges upon the notion of conditions of existence. The argument takes the general form “X ought to F, otherwise the organizationally closed system would cease to exist”.

However, once the notions at stake (“constraints”, “closure”, “dependence”, “conditions”, “existence”) have been clarified, the conditional argument no longer seems capable of delivering what it promised. I have maintained that the premise from which the OA starts is a *good* counterfactual argument that illuminates the objective, causal conditions for the existence of a closed system. Interpreted in a factual way, it also has explanatory import. However, I have argued that it becomes wrongheaded when the counterfactual is taken to entail normative ascriptions. Although closed organizations are indeed *special from the descriptive and explanatory point of view* (for they constitutively involve a particular form of closed causal relation of dependence), they are not in themselves *normatively special*, i.e., there is nothing in the mere existence of such causal closure that justifies considering it able to disclose particular normative considerations based on a counterfactual argument.

After having explored various interpretations of the argument—in particular the various meanings of “existence” and the conditions thereof—I have concluded that, given how these notions are spelled out, the OA argument is unwarranted, since the notions employed do not imply any normative attribution.

At this point a question comes to the foreground: Is an argument starting from counterfactual conditions of existence the only way to philosophically capture the link between organization and normativity? Though this is the only argument relied upon in OA literature to my knowledge, it need not to be so. After recognizing that the core OA argumentative strategy has critical shortcomings, we should acknowledge the alternative conceptual strategies that can be adopted to argue for the normativity involved in organized systems. These strategies have thus far been left implicit by OA theoreticians. One alternative approach, for instance, would be to use a more *stipulative* strategy to capture a particular connection between the regimes of organizations and forms of normativity. In that case, no direct move from causal conditions to normative ascriptions would be involved; rather, one could justify normative ascriptions based on the added explanatory value of the relevant stipulation. This might require further reflection regarding the alleged “objectivity” of the normative ascription (What grounds the stipulation? To what extent would the stipulation count as objective?). A similar strategy has been adopted in Millikan’s idea of theoretical definitions. Another strategy would be to explicitly associate the notion of biological organization with the notion of value—at the risk, however, of having to renounce the naturalistic credentials of the theory. Finally, the idea of “inner teleology” might be further clarified as a basis for developing normative considerations. The reasons for adopting one of these

strategies over another, and the strategies themselves, must be then better identified. In any case, further reflection is needed to ground the claims the OA framework wants to make.

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Declarations

Conflict of interest I thereby declare that I have no conflict of interest regarding this paper.

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