Philosophy of the Social Sciences
2014, Vol. 44(3) 365–374

DOI: 10.1177/0048393113491634
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Darwinism and Organizational Ecology: A Case of Incompleteness or Incompatibility?

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Abstract

Recently, Dollimore criticized our claim that Organizational Ecology is not a Darwinian research program. She argued that Organizational Ecology is merely an incomplete Darwinian program and provided a suggestion as to how this incompleteness could be remedied. Here, we argue that Dollimore's suggestion fails to remedy the principal problem that Organizational Ecology faces and that there are good reasons to think of the program as deeply incompatible with Darwinian thinking.

Keywords

Darwinism, interactor, Organizational Ecology, population, replicator

1. Introduction

In earlier work (Reydon and Scholz 2009; Scholz and Reydon 2010), we argued that Organizational Ecology, a self-professed Darwinian research

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Received 11 April 2013

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program in the domain of organizational science, does not have what it takes to actually *be* a Darwinian program. In a recent article, Dollimore (2014) criticizes our argumentation for failing to establish that Organizational Ecology indeed is not Darwinian in nature. According to Dollimore, what we have shown merely is that as a Darwinian research program Organizational Ecology is *incomplete*, not that it is inherently non-Darwinian or that it is fundamentally *incompatible* to Darwinian accounts of evolution. If more elements would be added and more details fleshed out, Dollimore suggests, in the end we will obtain a fully fledged Darwinian research program for organizational science. In addition, Dollimore advances a suggestion as to what would need to be added: she suggests a reformulation of Organizational Ecology using the concepts of "replicator" and "interactor" that were introduced by biologist Richard Dawkins (1976, 1982) and philosopher of biology David Hull (1980).[1]

We are indebted to Dollimore for her critique of our analysis of the nature of Organizational Ecology and for her support of several core elements of our critique. Dollimore and we agree, we believe, that Organizational Ecology in its present form stands on quite shaky theoretical foundations and thus faces a severe problem. But we present different analyses of what, exactly, is the problem and hence entertain diverging views regarding what could and should be done about it. We think it unlikely that Organizational Ecology will be able to construct a sufficiently solid Darwinian foundation and accordingly suggest that its proponents should reconsider what kind of research program Organizational Ecology could be, if not a Darwinian one.[2] Dollimore, in contrast, is more optimistic and sees ways to strengthen the Darwinian foundations of the program.

This difference of opinions presents us with a twofold challenge. First (Section 2), we are challenged to show more clearly and/or convincingly that Organizational Ecology is indeed *incompatible* to Darwinism, rather than merely being *incomplete* Darwinism. In addition (Section 3), we are challenged to examine Dollimore's proposal that the concepts of "replicator" and "interactor" will enable Organizational Ecologists to come up with a formulation of their program that (1) can be counted as a proper Darwinian program

[1]Dawkins's distinction is between replicators and vehicles, Hull's is between replicators and interactors.

[2]Note that we do not hold that there is *no possible* solid theoretical foundation for the program—only that it is highly unlikely that there is a Darwinian foundation in any meaningful sense of "Darwinian."

and (2) avoids the specific problems we highlighted in our previous publications on Organizational Ecology. Section 4 concludes.

2. Destructive Incompatibility or Remediable Incompleteness?

Our argument to the extent that Organizational Ecology is not a Darwinian research program focused on the notion of "population" in Organizational Ecology. We attempted to show that the way Organizational Ecologists conceive of populations of organizations does not fit the way populations are conceived of in evolutionary contexts and that, therefore, Organizational Ecologists cannot say to have identified entities that actually *evolve*, at least not in any way that even faintly resembles biological evolutionary processes.

The problem is the following. While Organizational Ecologists define organizational populations as sets of organizations that share a common organizational form, in evolutionary biology populations are conceived of as reproductive communities, that is, systems of reproductively interconnected organisms rather than sets of organisms that share a number of relevant traits. This is important, because their being systems of reproductively interconnected organisms is what makes biological populations into the sort of things that can partake in evolutionary processes in the Darwinian sense. If a population is to be able to evolve in an open-ended manner, as biological populations are, it should not be defined by means of one or several traits the possession of which constitutes a necessary and sufficient requirement for being a member of the population.

On the Organizational Ecologist's definition of organizational populations, in order to be counted as a member of a particular organizational population, an organization *must* exhibit the particular organizational form—whatever this may be and however it is conceived of—that defines the population. In addition, when a population is defined as a set of organizations with a particular form, any organization that exhibits this form—wherever it operates and with whomever it interacts—should be counted as a member of the population. Of course, researchers may choose to study only a subset of a set of organizations by considering only those members of the set operating in a particular location. In such a case, an additional characteristic is added to the set's definition: the set under consideration consists of organizations that share a particular organizational form and a particular operational environment or location. In any case, this essential trait or traits cannot become lost on pain of ceasing to be a member of the set: any organization that lacks one

or more of the essential traits defining a set automatically is not a member of the set.[3] This means that novelties can only occur in a very limited sense within an organizational population. Novelties that affect the defining essential traits, in particular novelties that change the defining organizational form, entail that the organization bearing the new trait ceases to be a member of its original population. By consequence, variation within populations—one of the driving factors in evolution—is severely limited: the members of an organizational population can only vary up to that extent which is determined by the population's definition.

Moreover, sets do not exhibit the internal connectedness that makes biological populations into units of evolution. As remarked above, biological populations are reproductive communities, that is, groups of organisms that are connected by ancestor-descendant and mating relations. Because of these relations, organisms in later generations in a population resemble successful organisms in earlier generations. In addition, biological populations are comparatively well buffered against the influx from genes from outside the population, giving evolutionary novelties a chance to establish themselves in the population before the trait pool becomes diluted with new traits flowing into the population from the outside. As sets, organizational populations are not the sort of things that exhibit this kind of internal connectedness and buffering. Thus, the organizational "populations" studied in Organizational Ecology are insufficiently like the organismal populations studied in evolutionary biology to act as entities in evolutionary processes.

To summarize, from a metaphysical perspective, the populations featuring in biological evolutionary processes are individuals, not sets of similar organisms. By conceiving of organizational populations as sets of similar organizations, Organizational Ecologists adopt a population concept that is at odds with evolutionary theory. If this is right, Organizational Ecology is incompatible to Darwinian accounts of evolution. The problem is not that something is missing from Organizational Ecology, but that a core element of the ontology of the account of organizational "evolution" on which the research program is built is categorically different from the corresponding element of the ontology of biological evolution. As long as Organizational Ecologists retain their view of organizational populations as sets rather than systems of interacting organizations, the research program will continue to be incompatible with Darwinism.

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[3]For reasons of simplicity, we use "set" to refer to intensionally defined groupings of things and ignore more subtle distinctions between sets, classes, kinds, and so on.

3. Replicators and Interactors to the Rescue?

Let us now turn to Dollimore's positive suggestion that a reformulation of Organizational Ecology using the notions of "replicator" and "interactor" might turn it into a full-fledged Darwinian research program. Note that Dollimore's paper fails to go substantially beyond merely putting this suggestion on the table. Dollimore (2014, 24) tells us that "the conceptual apparatus, in the form of the replicator-interactor distinction, now exists to enable organizational ecologists to develop a more complete Darwinian program." But she leaves most of the details to be filled in by others (as she implicitly acknowledges: Dollimore, 2014). She suggests that replicators may be identified on the level of organizational routines and interactors on the level of individual organizations (Dollimore, 2014; see also Hodgson and Knudsen 2004) but does not provide sufficient details to show that this move actually leads to the desired result. Filling in some of the details shows, we think, that Dollimore's suggestion does not solve Organizational Ecology's problems.

In the first place, it should be noted that the replicator–interactor framework by itself does not constitute a Darwinian ontology. Granting that one should be able to identify replicators and interactors (or vehicles) in a given domain for evolution to be possible in that domain, this is merely a necessary but not a sufficient requirement. Having identified replicators and interactors by itself does not give you Darwinian evolution. What needs to be shown in addition is that the domain encompasses replicators and interactors *of the right sort*. Darwinian evolution rests on the existence of nearly faithful reproduction that makes offspring organisms highly similar (but not identical) to their ancestors. It is such reproductive connections that build the entities that evolve (populations) and it thus needs to be shown that the interactors or vehicles identified in a given domain are related to one another in the right way.

Dawkins developed his replicator–vehicle distinction as a conceptual framework within which natural selection could be characterized and the units of selection could be identified (Dawkins 1982).[4] Replicators (genes for Dawkins) are the entities that survive in selection processes, while vehicles (organisms and possibly higher level entities too) are the entities that are selected. According to Dawkins's (1976, 16) original definition, a replicator

[4]Hull's (1980) replicator–interactor distinction serves the same purpose and Dawkins (1982, 46) pointed out that the terms "vehicle" and "interactor" have largely the same meaning.

is "a particularly remarkable molecule [that] had the extraordinary property of being able to create copies of itself." Alternatively, "[a] replicator may be defined as any entity in the universe of which copies are made" (Dawkins 1982, 46). Vehicles, Dawkins (1982, 46) writes, are entities "in which replicators travel about. Vehicle selection is the process by which some vehicles are more successful than others in ensuring the survival of their replicators." Identifying routines and the like as the replicators of Organizational Ecology and organizations as its vehicles or interactors seems to fit these definitions well.

While we agree that routines might be seen as replicators, we believe that it is not with the replicators that the problem lies—it is with the interactors or vehicles. Dawkins identifies organisms as the principal (and possibly only) vehicles of biological evolution, but acknowledges that vehicles might also be identified at other levels: cells and groups of organisms, for example. In the biological case, "*Each new vehicle comes into being through an act of reproduction*. New parts of vehicles come into being through growth" (Dawkins 1982, 54, emphasis added). Or as Dawkins writes a few lines later: "[o]ne act of reproduction, one vehicle" (1982, 54 and "[t]o qualify as a 'vehicle,' an entity must come into being by reproduction" (1982, 56).

Why this emphasis on reproduction? To achieve more clarity about this, we can consult Hull's definition of "interactor" and his account of natural selection based on the notions of "replicator" and "interactor." According to Hull (1980, 318), an interactor is "an entity that directly interacts as a cohesive whole with its environment in such a way that replication is differential." He goes on to define the selection process as "a process in which the differential extinction and proliferation of interactors cause the differential perpetuation of the replicators that produced them" (Hull 1980, 318; cf. Dollimore, 2014, 16). The causal connection between the extinction and proliferation of interactors and the differential replication of replicators is what brings reproduction into play.

In biological evolution, the differential success of interactors causes differential replication *via the reproduction of interactors*. Darwin saw that organisms tend to produce more offspring than can survive and concluded from this observation that organisms engage in a struggle for existence with each other and with their environments. By consequence, in the Dawkins/Hull terminology, vehicles (organisms) carrying replicators that benefit them in their struggle for existence will be able to produce more vehicles carrying these same replicators than do vehicles carrying less beneficial replicators. Biological populations are the systems *within which* replicators can multiply and minute beneficial variations at the replicator level can accumulate to cause novel traits. The existence of reproductive relations between interactors and of

populations of interactors as comparatively stable and buffered reproductive systems thus is crucial for the occurrence of Darwinian evolution. The problem for Organizational Ecology, then, is not so much that the mechanism of inheritance (or rather, transmission) of routines between organizations is unclear, as Dollimore (2014) suggests. Explaining how routines are transmitted between organizations will not solve the problem. Rather, the problem is that successful organizations (interactors) do not give rise to offspring organizations that closely resemble their "parents"—that is, that organizations do not "breed true" and, indeed, do not breed at all. There is no reason to think that routines are transmitted preferably to organizations of the same kind or set.

Organizational Ecology does not merely need replicators and interactors, but replicators and interactors of the particular sort that can constitute comparatively well integrated and buffered reproductive communities. Dollimore (2014, 15) suggests with respect to the interactor that "[i]n biology, this is the organism, and in the business world, this is the organization or the firm." We disagree: organizations or firms are interactors in the weak sense of entities interacting with their environments, but they are not interactors of the right sort, that is, interactors capable of forming evolving populations, because they do not reproduce their kind.

4. Conclusion

Dollimore (2014, 3) writes that we have overlooked the replicator–interactor distinction in our critique of Organizational Ecology and that we hold a "rather narrow formulation of Darwinism." We hope that the preceding considerations have made clear why we intentionally have not considered—but not overlooked!—the replicator–interactor distinction in our work on Organizational Ecology. While the distinction is an important conceptual tool for identifying the units of selection and describing a part of the ontology of Darwinism, we do not think the distinction will be able to serve as a cure for Organizational Ecology's problems. Identifying the replicators and interactors in the organizational domain is a first step toward an improved Organizational Ecology—here we agree with Dollimore—but doing so will not solve the main problem the research program faces, we contend. Organizational Ecologists will have to abandon their definition of organizational populations as sets of organizations that all share a common form and come up with an alternative definition to remedy the program's current incompatibility with Darwinian thinking. While we do *not* hold that it is in principle impossible to remedy this incompatibility, so far no account of organizational populations is available that actually does remedy it.

Dollimore's paper does not propose a cure either: Dollimore flatly claims that evolving populations can be found in the organizational domain, but stops short of actually showing us where they are or how we might identify them. Here, then, lies our principal challenge to proponents of Organizational Ecology.

While we agree with Dollimore that ours is a narrower view of Darwinism than hers, we do not think that ours is too narrow a view. We hold a comparatively conservative view of Darwinism, because of a—we think, healthy—skepticism toward what philosophers of biology David Hull (1998, 513) and Werner Callebaut (2011, 103) called "evolutionary everything." They referred to an exceedingly great enthusiasm for seeing Darwinian evolutionary processes in domains outside biology. "Evolutionary everything is hot right now," Hull (1998, 513) observed, and apparently this observation still holds. According to Callebaut (2011, 103),

> [a] recurrent problem with many of these transfers of evolutionary thinking to domains that did not originally identify themselves as dealing with issues biological . . . is that they often rely on a one-sided and rather shallow picture of the evolutionary process—typically, the "selfish gene" view popularized by Dawkins.

We wholeheartedly agree. And it seems that our caution even is shared by Dawkins (2008, 4-5) himself:

> Although Darwin's theory can be applied to much beyond the evolution of organic life, I want to counsel against a different sense of Universal Darwinism. This is the uncritical dragging of some garbled version of natural selection into every available field of human discourse, whether it is appropriate or not.
>
> Maybe the "fittest" firms survive in the marketplace of commerce, or the fittest theories survive in the scientific marketplace, but we should at the very least be cautious before we get carried away.

From our perspective, Dollimore's view of Darwinism is much too liberal, as from her perspective, our view appears too narrow. Dollimore wants to bring phenomena under the umbrella of Darwinian evolution that we think fall outside its scope—or more precisely: of which we think it has not yet been shown that they *do* fall within its scope. In such cases, the burden of proof, we contend, lies with those who entertain comparatively liberal views of Darwinian evolution. Thus, Organizational Ecologists will have to show that there *really are* Darwinian evolutionary processes out there in the organizational domain that can be accounted for by means of the same theory that does so much work in the biological domain—rather than

processes that merely *look like* biological evolution in some respects but are quite different in other respects.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

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