A Trilemma for Teleological Individualism[1]

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ABSTRACT

This paper addresses the foundations of *Teleological Individualism,* the view that organisms, even non-sentient organisms, are goal-oriented systems while biological collectives, such as ecosystems or conspecific groups, are mere assemblages of organisms. Typical defenses of Teleological Individualism ground the teleological organization of organisms in the workings of natural selection. This paper shows that grounding teleological organization in natural selection is antithetical to Teleological Individualism because such views assume a view about the *units of selection* on which it is only individual organisms that are units of selection. However, none of the Conventionalist, Reductionist, or Multi-Level Realist theories serve to justify such an assumption. Thus, Teleological Individualism cannot be grounded in natural selection.

Introduction

Teleological Individualism is the view that organisms, even non-sentient organisms, are end- or goal-

oriented systems while biological collectives, such as ecosystems or conspecific groups, are mere

assemblages of organisms. A maple tree grows upwards and outwards *in order to* soak up the sun, but

not in order to provide resources for the other organisms in its environment. Teleological Individualism

is a widely held view in applied ethics, particularly environmental ethics (Goodpaster 1978; Sober 1986;

Taylor 1989; Varner 1998; Cahen 2002; Sandler 2007; Odenbaugh 2010). The 'Individualism' in

Teleological Individualism has been taken as a consequence of adopting a particular account of the

teleological organization of non-sentient organisms. Just as proponents of etiological theories of

function have appealed to natural selection to explain the purported teleological nature of function ascriptions, Teleological Individualists have appealed to natural selection etiologies as a basis for the teleological organization of organisms. These Teleological Individualists have tended to adopt a view about selection on which only individual organisms are subject to natural selection (See especially Sober 1986; Cahen 2002; Odenbaugh 2010). The purpose of this paper is to show that these forms of Teleological Individualism are untenable. In what follows, I argue that the most common defense of Teleological Individualism is saddled with a commitment to defend a view about the units or levels of selection that excludes biological non-organisms, such as ecosystems, communities, or groups from being teleologically organized. I then raise a trilemma that shows that no such view is available to the Teleological Individualist given other commitments they hold. [2]

The paper proceeds by first elaborating on the details of Teleological Individualism and its importance in environmental ethics (Section 2). In this same section, I also explain why appeals to natural selection have seemed so appealing to proponents of Teleological Individualism. I then turn to the importance of the issue of the units or levels of selection to Teleological Individualism (Section 3). Whereas etiological theories of function are intended only to explain the end or purpose of a particular trait, Teleological Individualism requires that we identify organisms, but not biological collectives, as teleologically organized. Organisms aren't mere collections of teleologically organized parts; they are themselves teleologically organized. I argue that this commits Teleological Individualists to a view about

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[2] In the literature on environmental ethics, 'individualism' is used to denote a view on which individual organisms enjoy some privileged status (see, for example, Varner 1998). Views on which humans are the sole bearers of moral status and views on which all and only sentient organisms are bearers of moral status are all individualist views in this sense. However, in the philosophy of biology and biology literature, the term 'individual' is used in a variety of ways that are not, at least not necessarily, co-extensive with 'organism' (see, for example, Clarke 2010). 'Individual' sometimes refers to a unit of organization and there are arguments that some non-organisms are indeed biological individuals in the relevant sense. 'Individuals' is sometimes used in a way that is co-extensive with 'unit of selection' and, arguably, conspecific groups, communities, and organisms might be individuals in this sense. Yet another use of the term is in debates over the metaphysical status of species. One view is that species are individuals as opposed to being a natural kind. The 'Individualism' in Teleological Individualism follows environmental ethicists' use of the term.

the units or levels of selection, namely that it is only individual organisms that are units of selection. This commitment has gone largely unnoticed. Once it has been established, I turn to the trilemma for the Teleological Individualist by examining three broad families of views about the units of selection: Conventionalism, Reductionism, and Multi-Level Realism. I argue that there is no space among these families of views to justify Teleological Individualism (Section 4).

Teleological Individualism, Teleology, and Natural Selection

Why should we care which individuals and whether it is only organisms that are teleologically organized? In other words, why should we be concerned with the truth of Teleological Individualism? First, people often talk and behave as if plants and other non-sentient organisms are end-oriented or goal-directed. Philosophers have often identified the welfare of such organisms with those ends; we say that weed-killer is bad for or harmful to weeds and that nutrient rich soil is good for grass (Goodpaster 1978; Taylor 1989; Varner 1998; Sandler 2007).[3] Furthermore, we are often cautioned against seeing species or ecosystems as being similarly organized; we are told not to mistake the seeming goal-directedness of ecosystems or species that arise as behavioral byproducts of individual behavior with genuine teleology (Cahen 2002).

Teleological Individualism also serves as the cornerstone of one of the most prominent views within environmental ethics, Welfare-Based Biocentric Individualism. According to Welfare-Based Biocentric Individualism (from here on simply 'Biocentrism'), all living organisms but no groups, collectives, or wholes (such as ecosystems or species) have moral status. That is, living organisms, sentient and non-sentient alike, are deserving of our direct moral concern while non-individuals should

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[3] For defenses of such views see (Goodpaster 1978; Taylor 1989; Varner 1998; Sandler 2007). Some have recognized teleology as the best available basis for grounding the welfare of non-sentient organisms without accepting that such organisms do in fact have a welfare (Sober 1986; Cahen 2002; Odenbaugh 2010). For criticisms of the view that organisms have a teleologically grounded welfare, see (Feinberg 1963; Agar 1997; Sumner 1999).

figure into our moral deliberations only insofar as they affect the welfare of individual organisms.[4]

According to Biocentrism, what is distinctive about living organisms, in contrast with biological collectives, is that they have a *welfare* or *interests*; they are capable of being made better or worse off, benefited or harmed. It is here that Biocentrism depends on Teleological Individualism. While there are various ways that Biocentrists argue for the moral importance of organismic welfare[5], to my knowledge all, and certainly all of the most prominent, accounts of Biocentrism appeal to teleology to both (a) ground the welfare of non-sentient organisms and (b) to deny that biological non-organisms, particularly biotic communities and ecosystems, have a welfare.[6]

There is good reason to appeal to teleology to ground the welfare of non-sentient entities. [7] Since, according to Biocentrism, we have moral obligations in virtue of organisms having a welfare, welfare must be grounded in some way that is *non-arbitrary*; whether an organism has a welfare and what is good or bad for it shouldn't depend on factors like what humans care about, our anthropomorphizing, or on rough analogies about what we might want if we were a plant. If the welfare of organisms plays a role in determining our obligations, they should be objectively definable or

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[4] The term 'moral status' is used in a variety of ways in the ethics literature. It is sometimes used as a synonym for having intrinsic value, having moral standing, being a moral patient or subject, and having inherent worth (See, for example, O'Neill 2003; Sandler 2007; Sandler and Simons 2012; Liao 2010). Here, I use the term to pick out the concept that Teleological Individualists and Biocentrists are most often concerned with: to have moral status is to have a welfare or interests that ought figure into the moral deliberations of agents (Basl 2013).

[5] According to some, having a welfare or interests is sufficient for moral status. For example, Varner (1998) seems to argue for Biocentrism as if this is the case. Singer (2002) and Feinberg (1963) are sentientists that also endorse such a view and are thereby committed to denying that non-sentient organisms have a welfare (see also Korsgaard 2014 on this issue). Others (Taylor 1989; Cahen 2002; O' Neill 2003 Sandler 2007; Sandler and Simons 2012) think there is a conceptual distinction between having a welfare and its having moral significance. Goodpaster (1978) distinguishes between the intelligibility and the normative significance of attributing moral considerability to a being. This distinction roughly tracks the distinction between having a welfare and its being morally significant. For the purposes of this paper, I assume a distinction between having a welfare and its moral significance, but my arguments do not hang on this.

[6] See for example (Goodpaster 1978; Taylor 1989; Varner 1998; Sandler 2007; Sandler and Simons 2012). Even versions of Biocentrism that are not welfare-based often rely on claims of teleology that will implicate Teleological Individualism. For example, Schwietzer (1969) seems to use teleological language to articulate his form of Biocentrism.

[7] There are also accounts of health that are a-teleological. See, for example, (McShane 2004). However, these are typically appealed to in order to assign health to biological collectives.

specifiable.[8] Satisfying non-arbitrariness also seems important to accepting Teleological Individualism because otherwise it is hard to see why we couldn't simply assign whatever notion of welfare or teleology we like to non-individuals.

In addition to the requirement that welfare be assignable in a non-arbitrary way, the welfare of such organisms must be *non-derivative*; the welfare of a non-sentient organism should not be ultimately defined in terms of what is good for other organisms.[9] This seems to follow from what 'moral status' means. If what is good for a maple tree is defined or grounded ultimately in what is good for humans or other sentient beings, any obligations we have to take the welfare of the maple tree seriously are really obligations to others with moral status; it is not the maple tree that has moral status.

An account of welfare in terms of teleology has seemed well-suited to meet the requirements of non-arbitrariness and non-derivativeness. If an organism is genuinely teleologically organized, i.e., it has ends or goals, then its welfare can be defined objectively in terms of those ends or goals. It is because the maple tree has an end of growth by photosynthesis that growing tall and wide is good for it, and, in turn, it is the ends of survival and reproduction that explain why it is good for such a tree to grow tall and wide to soak up the sun. We need not make potentially specious inferences from our preferences to what would be good for a non-sentient organism. An organism's teleology serves as an objective basis for defining its welfare. Furthermore, if an organism is genuinely teleologically organized, then defining interests in terms of those ends will be non-derivative. Those interests will depend in no essential way

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[8] This is not to presuppose any form of metaethical objectivism about values. What ultimately grounds the normativity of welfare, if it is indeed normative, may be subjectivist in nature.

[9] It is possible to give an account of the welfare of a non-sentient organism that is non-arbitrary even though it is grounded in what humans care about. We could, for example, define what is good for non-sentient organisms in terms of what promotes our welfare. There are, at least plausibly, objective facts about what makes our life go well and what those facts will, in some cases, depend on our concerns, desires, or attitudes. On such a view, what is good for non-sentients will be objectively definable but derivative on the good of another being; non-sentient organisms will not have a *good of their own*.

on what's good for others or what other individuals care about. Weed killer is bad for weeds because it undermines their ends independent of the fact that what's good for our lawn is that they be killed.

Appealing to teleology to satisfy the conditions of non-arbitrariness and non-derivativeness succeeds only insofar as there is some way to ground teleology itself. To simply assert that maple trees have survival and reproduction as an end for no reason or because those are our ends or because our ends depend on their survival would undermine the claim that teleology grounds welfare in a way that is non-derivative or non-arbitrary. What prospects are there for grounding teleology in a way that satisfies these conditions?

There are various attempts to spell out what constitutes or grounds teleological organization. Some think that intentionality is necessary for teleology, that only the products or results of intentional design are teleologically organized. Obviously, the Teleological Individualist must reject such views. On other accounts of biological teleology, what accounts for a biological system being teleologically organized is that it and its processes are self-determining; the system persists because of the organization and activity of its parts and processes (Mossio, Saborido, and Moreno 2009; Mossio and Bich 2014).[10] However, even if such accounts ground teleology in a way that is non-arbitrary and non-derivative, they cannot justify Teleological Individualism. As proponents of such views are quick to admit or argue, such accounts are compatible with or justify the claim that supraorganisms, biological collectives or other non-organisms are teleologically organized (Mossio and Bich 2014; Holm 2012; Holm 2013b; Holm 2013a). Those committed to Teleological Individualism must rely on an account of teleological organization that satisfies conditions of non-arbitrariness and non-derivativeness, but also on which the commitment to individual organisms as the sole unit of teleological organization can be justified.

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[10] For a slightly different take on an account on which organization is based on integrated systems, see (Dussault and Bouchard 2016).

Teleological Individualists seeking to explain the teleological organization of non-sentient organisms have here typically appealed to evolution by natural selection as the source of teleology in non-sentient organisms. Even those with no particular stake in whether non-sentient organisms are in fact teleologically organized have appealed to natural selection as a necessary condition for such organization. Both Sober (Sober 1986) and Odenbaugh (2010), for example, argue that ecosystems cannot be teleologically organized because they are not subject to or the result of evolution by selection. Cahen (2002) makes the same argument concerning all biological collectives, from ecosystems to conspecific groups.

Appealing to natural selection to ground teleology is appealing for a variety of reasons. First, not only does natural selection provide a *naturalistic* ground for teleology as opposed to a religious or supernatural one, but it also provides Biocentrists with a basis for excluding simple artifacts, like corkscrews and can-openers, from the domain of things that have moral status, so long as natural selection etiologies of the right kind are taken as both necessary and sufficient for teleological organization. Since artifacts are not the result of natural selection, they do not have the relevant sort of teleology to qualify as having a welfare.[11]

Second and perhaps more importantly, there is precedent in the work on biological functions for grounding teleology in evolution by natural selection. Proponents of *etiological theories of biological function* claim that function ascriptions are essentially teleological (See, for example, Wright 1973; Millikan 1989; Neander 1991).[12] That is, to identify the function of a biological trait is to identify not

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[11] Whether this appeal to the difference between natural and artificial selection is adequate to distinguish organisms from artifacts has been called into question (Basl and Sandler 2013a). Furthermore, so far as artifacts are the results of co-evolution of genes and culture due to cultural selection, it may be that these artifacts result from the same sorts of selection processes as organisms. If that is so, the Biocentrist faces additional difficulties. Special thanks to an anonymous referee for raising this additional challenge.

[12] Readers familiar with the literature on functions will be more familiar with the notion of 'normativity' as opposed to 'teleology'. As ethicists typically use the term, 'normative' implies reason-giving. I use 'teleology' instead, since, with a few exceptions, proponents of etiological views do not think that functions are reason-giving

merely what it does but what it is *supposed to do*. The heart provides a familiar case: the function of the heart is to pump blood, not to make thump-thump noises. This is so even when a heart fails to pump blood. This function ascription is teleological. According to etiologists, the very notion of a defective heart, one that fails to function properly, presupposes that functions are teleological. According to etiologists about function, this teleology is ultimately analyzed or explained in terms of evolution by natural selection; the ends or purposes or functions of a trait are those that resulted in selection for that trait in prior generations.

Biocentrists can piggyback on this theory of functions without having to adopt or endorse the etiological account of functions. Such accounts are attempts to understand 'function' and not attempts to ground a notion of interests.[13] Biocentrists and others thinking about naturalized teleology implicitly (Taylor 1989; Sandler 2007; Sandler and Simons 2012) or explicitly (Cahen 2002; Varner 1998; Odenbaugh 2010) tend to employ an *etiological account of teleology* (Basl and Sandler 2013a). According to such accounts, natural selection, in some fashion, grounds the teleology of organisms independent of whether we ultimately analyze function ascriptions in terms of natural selection. Teleological organization can be analyzed or characterized in terms of natural selection etiologies even if the notion of function cannot or is not.

Before turning to the details of the etiological account of teleology, it is perhaps helpful to summarize the preceding discussion: Teleological Individualism is a widely held view motivated largely by a desire to give an account of the teleological organization of non-sentient organisms (an account that often plays a role in explicating the welfare of such organisms). Proponents of these views find

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or provide reasons to do or believe anything. For a discussion of potential exceptions see (Foot 2003; Hursthouse 1999; Thomson 2008).

[13] It may turn out that pluralism is the correct view about functions (Millikan 1999) or that function is not, ultimately, teleological (Cummins 1975; Bigelow and Pargetter 1987; Wouters 2005).

etiological theories of teleology compelling because among other desirable features, they seem to ground teleology in a way that satisfies two conditions:

(a) **Non-Arbitrariness**: Whether a being is teleologically organized, and what their ends are, must be objectively specifiable.

(b) **Non-Derivativeness**: Whether a being has ends, and what their ends are, must not be reducible to the ends of some other being.[14]

Furthermore, grounding teleology in this way has seemed to justify a commitment to organisms as the sole units of teleological organization because in their view, it is only individual organisms, but not biological collectives that are subject to evolution by natural selection.

Etiological Accounts of Teleology and The Levels of Selection

The question of the *levels* or *units of selection*, of which levels of biological organization are subject to natural selection dates back to at least Darwin (Darwin 1964; Sober 2010) and has attracted much attention since.[15] Is it only individual organisms that evolve by natural selection or do some traits evolve because they are good for the group? Does natural selection even operate on individuals or is it the genes which are the unit of selection? In the rest of this paper, I will show that no matter how one answers these questions, one cannot consistently ground teleology in evolution by natural selection in a way that jointly satisfies Non-Arbitrariness, Non-Derivativeness, and serves as a basis for Teleological Individualism. In other words, the most commonly accepted and defended form of Teleological Individualism is implausible. The argument proceeds in two stages. In this section, I will briefly argue that those that ground their Teleological Individualism in an etiological account of teleology are committed to adopting a particular view about the units of selection, namely they must adopt the view

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[14] In addition to these conditions, others are often taken to be necessary conditions for an account of the teleology of organisms. These include that simple artifacts and other self-sustaining systems such as tidal systems or flames be excluded from the domain of the teleologically organized. For a discussion of these conditions see (Basl and Sandler 2013a; Basl and Sandler 2013b; Holm 2012).

[15] For contemporary discussions of the issue see, for example, (Sober and Wilson 1998; Okasha 2006; Lloyd 2007).

that organisms are the exclusive unit of selection. In the following section, I will argue that there is no view about the levels of selection that also satisfies Non-Arbitrariness and Non-Derivativeness.

Why should the Teleological Individualist even be concerned with the levels of selection? Why isn't it enough that proponents of etiological accounts of function have paved the way for naturalized teleology by appeal to natural selection? After all, defenders of etiological accounts of *function* don't get bogged down in debates about the levels of selection. The answer is that the etiologist about function and the Teleological Individualist have different aims: the former is concerned with explaining the ends or purposes of *particular traits* while the latter is concerned with explaining how it is that organisms, not merely their parts, are teleologically organized units or wholes. There is something about an organism that makes it itself a unified, end-oriented whole; it is the bearer of traits not merely a collection of them. Just as a clock differs from an unorganized pile of otherwise identical clock parts, an organism is unified in a way that a pile of traits is not. To accept that being a collection of teleologically organized parts is sufficient for being a teleologically organized whole would introduce a serious problem for the Teleological Individualist: why should we not see the endocrine system as a teleologically unified whole among others occupying a similar space as other unified wholes? Why shouldn't we recognize an ecosystem as a teleologically unified whole?

Appealing to a view about the level of selection, at least at first glance, seems to resolve these issues. It is true that a human being is a teleologically organized unit in way that the heart is not; hearts were selected for because of the contribution such organs made to the fitness of *individual* organisms. Hearts do not pump blood because they increase(d) the fitness of others, but the fitness of individuals (Cahen 2002; Odenbaugh 2010). The same can be said of many of the traits of non-sentient organisms; they exist as they do because of the contributions they made to the survival and reproduction of individuals in an ancestral lineage. So, in answer to the question "why should we see an organism as something that is a teleologically unified whole as opposed to a mere collection of teleologically

organized parts?", we can reply that it is because "organisms are the unit of selection, not their parts!"
Their parts evolve because of the contribution they make to the fitness of the organism as a whole!".

We can, for my purposes, set aside the details of how to analyze the teleological organization in terms of

the units of selection. All that matters is that the Teleological Individualist must adopt some stance on

the issue and then develop an analysis. Otherwise, identifying individuals as the unique bearers of

teleological organization will be merely by fiat (thus violating Non-Arbitrariness).

A Trilemma for Etiological-based Teleological Individualism

There are three broad positions concerning the units of selection: Conventionalism, Reductionism, and

Multi-Level Realism. It is a condition of accepting a form of Teleological Individualism on which teleology

is grounded in natural selection that one accepts that only individual organisms are units of selection. If

one accepts that biological collectives are units of selection, then they might also be teleologically

organized. If one denies that individual organisms are units of selection, then organisms will not be

teleologically organized. Additionally, recall that proponents of Teleological Individualism are committed

to grounding teleology in a way that satisfies the conditions of (a) Non-Arbitrariness and (b) Non-

Derivativeness, i.e., the ends of an entity must be objectively specifiable and must not reduce to the

ends of others. The question for etiologically-based Teleological Individualism is whether there is space

within Conventionalism, Reductionism, or Multi-Level Realism where these conditions are jointly

satisfied. I will argue that the answer is "no", that whatever view about the units of selection one

adopts, one of these conditions will not be satisfied. Therefore, etiologically-based Teleological

Individualism must be rejected.[16]

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[16] Some of this discussion is adapted from and further developed from previously unpublished work (Basl 2011). I
include the citation here only because others have cited this work in discussions of this topic (R. A. Wilson and
Barker 2013; McLoone 2015).

Conventionalism

According to Conventionalism, there is no objective fact about the level of selection (Kitcher and

Sterelny 1988; Kerr and Godfrey-Smith 2002; Waters 2005).[17] Instead, whether we describe a process as

group selection, individual selection, genic selection, etc. depends on context. If it is easier to assign

group fitnesses to "groups" within a metapopulation and explain the evolution of a trait in those terms,

so be it. However, even when there are populations that can plausibly be understood as divided into

groups, say groups containing altruistic individuals, selfish individuals, and mixed groups, there are

mechanisms by which we can translate those group fitnesses into individual, or genic, fitnesses.[18]

On the one hand, the tools that Conventionalists have employed to translate from one level of

selection to another purportedly make it possible to view all natural selection as occurring at the level of

the individual. That sounds great for Teleological Individualism except that such a view immediately

violates both Non-Arbitrariness and Non-Derivativeness. Whether an organism is ultimately

teleologically organized depends on our ends or aims. It is our wanting to describe or model some

system which determines whether organisms are teleologically organized and so their goal-directedness

reduces to ours, thus violating Non-Derivativeness. For the same reason, grounding Individualism in

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[17] I'm glossing over important differences between various versions of Conventionalism. Kitcher and Sterelny (1988), for example, occupy a strange middle-ground between Conventionalism and Reductionism; they argue that the level of selection relevant to the evolution of a trait is a matter of convention, but give special place to the gene because an explanation in terms of genes can always be given, whereas, for example in populations without groups, a group-level explanation is not always available. Dawkins, while originally adopting a form of Reductionism which was realist in nature (Dawkins 1989), later (Dawkins 1999) espoused a form of Conventionalism similar to the version endorsed by Kitcher and Sterelny. (Thanks to an anonymous referee for pointing me to this feature of the later work of Dawkins.). For a discussion and challenge to views of this form, see, for example, (Lloyd 2007).

[18] Kin Selection Theory (Smith 1964), Inclusive Fitness Theory (Hamilton 1964a; Hamilton 1964b), and Game Theoretic Approaches (Axelrod and Hamilton 1981) have been used as tools to understand selection processes that seem to be at the group level in terms of selection at a lower level. Inclusive Fitness Theory, for example, assigns traits an *inclusive fitness* on the basis of the average fitness of individuals with that trait across a population. So for example, the inclusive fitness of an altruistic individual is a function of how fit altruists are across all groups in a population. Altruism can only evolve by selection if altruists have a higher inclusive fitness than non-altruism. For criticisms of the attempt to undermine multi-level selection by appeal to these tools see (Sober and Wilson 1998; Sarkar 2007; Sober 2010, chap. 2).

Conventionalism violates Non-Arbitrariness because in order to specify an entity's ends we must appeal to human interests and the ends of that entity aren't objectively specifiable.[19]

This is not to say that the choices Conventionalists make about how to model selection are arbitrary in the sense of random. There may be basis in biological facts for explaining the evolution of a trait in a given context in terms of one level of another, but Conventionalism is by its very nature at odds with the sort of metaphysical realism that is inherent to Teleological Individualism. The Teleological Individualist thinks there really is something special about *individual organisms*; they and only they *really* are the units of teleological organization. The Conventionalist thinks there is no such reality about the level at which selection operates and so the Individualist must simply insist on their favored perspective. [20]

On the other hand, while a Conventionalist may be entitled to view selection as occurring only at the level of individual organisms, they are equally entitled to see it always as occurring at the level of the gene or sometimes occurring at the level of the group.[21] This is bad for Teleological Individualism. Any attempt within a Conventionalist framework to narrow the scope of selection violates Non-

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[19] This happens to be a case where there is a failure to satisfy both Non-Arbitrariness and Non-Derivativeness for the same reason, but these conditions can come apart. For example, consider that we might attribute to the host of a parasite the end of nourishing the parasite. This end might be objectively specifiable in terms of the teleology of the parasite, but it will not satisfy Non-Derivativeness; this end really reduces to the parasite's ends. Similarly, a child, as children are wont to do, might attribute ends to an inanimate object. Those might be taken to be ends of the object itself, i.e., they are non-derivative, but they are arbitrary.

[20] In "Ecosystem Health", Katie McShane (2004) raises doubts about whether our choices about what constitutes an ecosystem undermine claims about ecosystems having a health. She argues that just because our choices determine which things make up an ecosystem, this doesn't undermine the claim that whatever ends up being an ecosystem relative to our choices might have a health. Perhaps the Biocentrist can similarly embrace Conventionalism to avoid the criticisms just raised.

Even if McShane is right that Conventionalism doesn't undermine attributions of health or welfare, this is of no help to the Individualists. This is because as a matter of convention, in at least some contexts, there is no problem describing selection as operating at the level of non-individuals such as groups. Even if Conventionalism doesn't undermine genuine teleological organization, it is too permissive to ground Individualism.

[21] It is perhaps not possible to model the selection of every trait as resulting from group or community level selection.

Arbitrariness or Non-Derivativeness. Therefore, Teleological Individualism cannot be grounded in Conventionalism.

Multi-Level Realism

Multi-Level Realism is the view that there is a fact of the matter about the level at which selection operates and that it might operate at all levels of organization from the gene up to the ecosystem. There are various forms of Multi-Level Realism. Perhaps the most prominent is Sober and Wilson's Trait-Group Framework (Sober and Wilson 1998).[22] The Trait-Group Framework consists primarily of a criterion of grouphood and a set of definitions for selection at various levels. According to the criterion of grouphood groups are *trait-relative*; two organisms might constitute an evolutionary group relative to one trait, but not another. Organisms, of any species, constitute a group relative to a trait when the fitness of those organisms (relative to that trait) depends on what variant of the trait other individuals have.

As an example, consider a population with individuals that (a) are identical except with respect to sharing behavior and (b) partner for life with another individual. Individuals have one of two variants of the sharing behavior: they are either selfish 'S individuals' that do not share any of the resources they gather, or altruistic 'A individuals' that split their gathered resources with their partner. Let's also assume that more resources directly correlates with reproductive success (more resources means a longer life and more offspring). What is the fitness of an A individual in this population? That depends on whether that A individual is paired with an S individual or another A individual. Therefore, according to the concept of grouphood, pairs in this population are *trait-groups*.

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[22] I've chosen the Trait-Group Framework for the purposes of illustration, but the conclusions drawn generalize to any form of multi-level realism. For a comprehensive discussion of the problem of the units of selection see (Okasha 2006). See also (R. A. Wilson 2004b). For a criticism of the Trait-Group Framework see (Basl 2011; McLoone 2015).

The criterion for grouphood tells us when a population contains groups, but not whether there is group selection for any given trait. That depends on the definition of group selection. According to the Trait-Group Framework, group selection occurs when there is selection among groups, i.e. when there is a difference in fitness between trait-groups. Individual selection occurs when there is selection within groups, i.e., when there are differences in fitness between individuals within groups (Sober and Wilson 1998, chap. 3).[23] Going back to the above example, let's say that groups of A individuals have a higher fitness than both groups of S individuals and mixed groups. In this population, there will be group selection for altruism because there will be selection among groups with more A individuals. There will also be individual selection within mixed groups for selfishness because S individuals in those groups reap the benefits of being with an altruist but share nothing.[24]

Multi-Level Realism, is, by its very nature, inconsistent with the Teleological Individualist's commitment to organisms being the sole unit of selection. The Teleological Individualist cannot adopt this view about the level of selection but must instead argue that the conceptual frameworks, such as the Trait-Group Framework, endorsed by Multi-Level Realists are somehow mistaken or inadequate for understanding natural selection.[25] If Multi-Level Realism is true, whether collectives such as groups, biotic communities, or ecosystems are teleologically organized (and thereby qualify as having a welfare), is ultimately, an empirical question. Once we settle on how to understand what constitutes a 'group', 'population', 'selection at a level', etc., it will be up to biologists to determine how often the relevant

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[23] If a population does not contain any groups, individual selection need not occur within groups; instead, it is defined in terms of difference in fitness between individuals in the population.

[24] The example I've used to explain the Trait-Group Framework appeals to individuals vs. group, but the definitions generalize. "Individuals" and "groups" can be understood to represent particles and collections at any level of organization. For example, the individuals might be genes and the groups might be organisms, or the individuals might be organisms and the groups ecosystems. The Trait-Group Framework is a framework for understanding selection at any level of biological organization (Okasha 2006; Sober and Wilson 1998, 96).

[25] For some criticisms of the Trait-Group Framework see (Basl 2011; McLoone 2015).

conditions for selection at a non-individual level are met.[26] And, there are familiar examples in the

literature of, for example, group selection (see for example Wade 1976; Goodnight and Stevens 1997;

Sober and Wilson 1998;; R. A. Wilson 2004a; see also Godfrey-Smith 2009).[27, 28]

Reductionism

Among biologists and the public, Reductionism, the view that, as a matter of fact, only individual

organisms are units of selection, is the most prominent view about the levels of selection. This is thanks

largely to the popularity of Dawkin's *The Selfish Gene* (1989) and, within biology, to the lasting influence

of George C. Williams *Adaptation and Natural Selection* (1996) as well as the development of kin

selection theory and inclusive fitness theory.[29] It also seems the most promising basis for an

etiologically-based Teleological Individualism given that it is a realist theory of selection and because

proponents of such views have largely been developed and employed to undermine claims that

biological collectives are units of selection.

There are many forms that Reductionism takes depending on the motivations for the view.

Historically, one of the primary motivations for Reductionism comes from taking what Dawkins calls the

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[26] How often the conditions for group selection will be met may vary considerably depending on what those conditions turn out to be. For example, Godfrey-Smith (2009) develops an account of selection on which collections of entities, "Darwinian Individuals", evolve by natural selection or are likely to do so to the extent that they form a "Darwinian population" which is a function of how well they satisfy various conditions drawn from the Lewontin Conditions. Godfrey-Smith thinks that what might be seen as paradigm groups on other models of group selection do not constitute Darwinian populations. But, again, this will ultimately be an empirical issue to be resolved once we've opted to understand group selection according to the Darwinian population model.

[27] For a discussion of community or ecosystem selection in artificial contexts see (Swenson, Arendt, and Wilson 2000; Swenson, Wilson, and Elias 2000; D. S. Wilson and Swenson 2003). For a discussion of the limits of community selection see (Basl 2011).

[28] It's worth mentioning that whole ecosystems or entire species are not likely to be units of selection; it is unlikely that they will satisfy the relevant definitions of grouphood. So, the Teleological Individualist might be right to criticize views on which these sorts of entities are seen as teleologically organized. But, that does not mean that bee hives, ant colonies, or multi-species communities, for example those that form symbiotic relationships, are not units of selection.

[29] For a discussion of the role Kin Selection and Inclusive Fitness Theory have figured into debates about the levels of selection see (Sober 2010, chap. 2)

"gene's eye view" of selection.[30] Dawkins's picture of selection is one on which replicators compete with one another to pass on copies of themselves. Replicators are entities which pass on structural information from generation to generation. The copying mechanism need not be perfect, but copies should be structurally similar, and should themselves be capable of creating accurate copies through time. While other structures could potentially serve as replicators, the replicators of evolutionary biology are genes. Cells and bodies are machines, vehicles, or *interactors* that genes use to win out in competition with other genes, where winning out means producing more copies.[31] On this picture of selection, there is no room for individuals, let alone groups, to be seen as units of selection; they are merely tools. True, it is the interactors that are exposed to the elements, as it were, but behind the scenes the gene is at work. Phenotypes do well or poorly only insofar as they result in more copies of the replicators that gave rise to them. Therefore, the replicator enjoys a privileged place.

Dawkins prefers this "gene's eye view" of selection because he sees it as helping to solve the puzzle of altruism. There are cases where organisms seem to behave in ways that are costly in terms of reproduction, but that benefit others. How could selection, which favors reproductive success, result in such altruism? Dawkins's answer to this was to appeal to what is good for genes of the same type. The gene doesn't care if its interactor does poorly so long as more copies of the replicator are passed on. Sometimes, an interactor's behaving in a way that lowers its reproductive success will increase the copies of the gene in the next generation. Consider, for example, long term parental care. From the gene's perspective, offspring carry copies of the replicator and so the parent's sacrifice isn't costly to the replicator so long as it increases the number of replicators in future generations.

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[30] It is worth noting that this view has been widely criticized and is no longer widely accepted among biologists and philosophers of biology. Still, given the prominence of this view outside of biology, it is worth recognizing the challenges for adopting an etiologically-based Teleological Individualism if one accepts such a view.
[31] See also (D. L. Hull 1980; Dennett 1995).

This view of selection can be contrasted with what might be called the Standard View. According to the Standard View, selection should be understood in terms of the Lewontin Conditions.[32] Lewontin (1970), in a paper on the levels of selection, described the Darwinian principle of evolution by natural selection in terms of populations of entities that *vary in phenotype*, where phenotypes *vary in fitness*, and where phenotypes are *heritable*. According to Lewontin, these conditions are necessary and sufficient for evolutionary change by natural selection.[33] Unlike the gene's eye view, the Standard View is *level-neutral*; it includes no commitment to the level at which selection operates. Lewontin's paper includes a discussion of the extensive range of levels at which he thinks selection might operate from genes, to cells, to organs, to organisms, to groups and beyond.[34]

Whether one adopts the gene's eye view or the Standard View, one cannot successfully use either view as a basis Teleological Individualism. Adopting the gene's eye view seems to immediately preclude a commitment to Individualism in the sense we have been discussing. It is genes that are the primary unit of selection and so it will be some component of genes that are teleologically organized towards achieving the ends of the gene.[35] But, the Teleological Individualist is concerned with carving out space for individual organisms. The Biocentrist, for example, does not think that genes have moral

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[32] This expression is borrowed from (Godfrey-Smith 2009).

[33] The Lewontin Conditions are not, in fact, sufficient for evolution by natural selection. Even when a population has members that satisfy the conditions, if mutation rates are too high or there is sufficient evolution due to drift, the effects of selection can be undermined. Peter Godfrey-Smith has, helpfully, defended the Lewontin Conditions as a general kind of recipe for natural selection even though the addition of other factors can undermine selection (Godfrey-Smith 2009, chap. 2).

[34] Are there grounds for adopting the Standard View over the gene's eye view? I think so. Perhaps the most compelling is that we take it that genes are the result of selection, but if selection is defined in terms of genes, they cannot themselves be the results of selection (Godfrey-Smith 2009). However, the committed gene's eye-er might respond that it is replicators more generally that are the units of selection and genes are the result of selection of more primitive replicators.

[35] There is an interesting question about how to understand genes as being teleologically organized. What exactly is it that is so organized? There is, as far as I know, little discussion of this since most Teleological Individualists with an interest in these issues typically talk as if it is individual organisms that are teleologically organized even if they adopt a form of Reductionism. Lewontin (1970) discusses molecules as units of selection. Perhaps we should understand the molecular structure of DNA as that which is teleologically organized. Thanks to an anonymous reviewer for raising this question.

status, but the organisms that have genes. On first glance, Reductionism is actually at odds with Teleological Individualism.

Are organisms really precluded from being teleologically organized if we adopt the gene's eye view? After all, interactors have ends or purposes. Their ends are to interact with the world for the purposes of propagating copies of genes. Why can't the Teleological Individualist adopt the gene's eye view and recognize organisms as teleologically organized interactors? They might be forced to accept that genes are teleologically organized units, but their teleological organization substantially overlaps with the teleological organization of their interactors, or so it seems. So, for most intents and purposes, it is fine to accept that genes are teleologically organized units along with individual organisms. Teleological Individualism is perhaps diminished, but not badly so.

The problem is that nothing precludes collectives such as conspecific groups or multi-species communities as serving as interactors. The gene's eye view was developed, in part, to resolve the problem that sometimes groups seem to be units of selection; on the gene's eye view, groups can be interactors. So, the Teleological Individualist hoping to ground their view in the gene's eye view must find some way to non-arbitrarily exclude these collective interactors.[36] It seems then that joining an etiological account of teleology with gene's eye view reductionism fails to yield a privileged place for organisms or preserves it by violating Non-Arbitrariness.

While the Standard View doesn't immediately entail that organisms are the sole units of selection, neither does it rule it out. However, the Teleological Individualist that wishes to defend their view while adopting the Standard View must provide some reason for thinking that, as a matter of fact rather than as a conceptual consequence, it is individuals that are the sole unit of selection. In *Adaptation and Natural Selection*, George C. Williams argues that we should understand selection as

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[36] McShane (2014) has, independently, developed a similar criticism.

operating at the level of individual organisms rather than groups on grounds of parsimony. He claims on grounds of parsimony that the concept of adaptation is "onerous", to be invoked only when necessary and, furthermore, he claims that higher-level selection is a more onerous concept than lower-level selection and so higher-level selection explanations should be invoked only when it is impossible to explain the existence of a trait in terms of lower-level processes. In his words:

> The ground rule – or perhaps *doctrine* would be a better term – is that adaptation is a special and onerous concept that should be used only where it is really necessary. When it must be recognized it should be attributed to no higher a level of organization than is demanded by the evidence. In explaining adaptation, one should assume the adequacy of the simplest form of natural selection, that of alternative alleles in Mendelian populations, unless the evidence clearly shows that this theory does not suffice (Williams 1996, 4–5).

After explaining this doctrine, Williams goes on to discuss adaptations, such as altruistic ones, that seem to call out for explanations in terms of higher-level processes. He tries to explain each away by offering an alternative explanation in terms of lower-level processes,[37] and as noted above, there are various tools that one might use to explain selection in terms of individuals.[38]

For purposes of argument, let's just assume that for any trait that we wish to explain in terms of natural selection, there is some way to explain it in terms of individual selection. Does parsimony give us any reason to prefer that explanation to the higher-level explanation?[39] It does not. To see why, first distinguish between two different contexts. In some contexts, even those that disagree with Reductionism will agree that a trait probably evolved by selection at the level of the individual. This is because different conditions must be met for group selection to occur than for individual selection to

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[37] See for example (Williams 1996, chap. 7).

[38] The same tools available to the Conventionalist, inclusive fitnesses, game theory, etc. are available to the Reductionist to explain selection at some higher-level in terms of individuals or members at some lower-level of biological organization.

[39] For a recent overview and discussion of parsimony reasoning in biology, see (Sober 2015). Sober argues that parsimony considerations don't *generally* tell in favor of hypotheses. Instead, the heuristic value of parsimony is limited to specific contexts.

occur. Group selection, for example, requires groups of organisms that vary with respect to some heritable trait. In such a context where the conditions necessary for group selection are not present, we should prefer a lower-level selection process to a higher (though of course the trait might have evolved by something other than natural selection). But, in this context, it isn't parsimony that gives us a reason to prefer one selection hypothesis to the other; it is simply a matter of group selection not being a viable explanation at all.

Consider instead another context, one where proponents of group selection think the conditions necessary for group selection are present. In this context, does parsimony give us reason to prefer the lower-level selection hypothesis? While there are a variety of views about how best to understand what parsimony is, it isn't obvious in such a case that one of these hypotheses is more parsimonious than the other. To say that something evolved by group selection is not to propose anything metaphysically burdensome; it is to propose the existence of groups that meet the Lewontin Conditions. If those conditions are met, then the groups will be subject to natural selection and under the right conditions, that group selection will result in evolution.

Of course, the proponent of Reductionism might argue that those conditions are never or hardly ever satisfied, or that group selection is relatively weak compared to individual selection and so there is never or hardly ever evolution by group selection. But, these seem to be empirical claims that might be advanced against a particular selection hypothesis rather than reason to accept Reductionism on the basis of parsimony. More importantly, even if higher-level selection forces are relatively weak or if the conditions are not often met, this is antithetical to Teleological Individualism, especially given the purposes to which it is often employed. It turns out that Reductionism of this form doesn't justify Teleological Individualism and so doesn't justify the view that only individual organisms have a welfare. For those Teleological Individualists that have thought something about the nature of selection itself

precluded the teleological organization of biological collectives, this version of reductionism is of no help.

This result is unsurprising given that the Lewontin Conditions are level-neutral. If we accept something like these conditions, whether reductionism is true is a contingent, empirical matter. The Teleological Individualist can, of course, wishfully bet on the facts coming out in a way that support their view, but it is worth noting that this would be a radical departure from how Teleological Individualists have tended to argue that biological collectives are not teleologically organized. More importantly, it seems that this empirical bet is a bad one, at least if the bet is that there are no instances of evolution by natural selection at levels above the individual organism. As discussed in the previous section, proponents of Multi-Level Realism claim to have at hand various instances of traits that have evolved by higher-level selection processes. Even those, like Godfrey-Smith, that endorse views on which it is relatively more difficult for groups of organisms to satisfy the conditions necessary for evolution by natural selection, acknowledge that there are some instances of selection at these levels or at least that they satisfy some conditions that make selection at these levels possible (Godfrey-Smith 2009 see especially ch. 6).[40]

Conclusion

The Teleological Individualist is, I think, in trouble. The picture I have painted is one on which the most widely-adopted and, I think, most plausible defense of the view grounds teleology in the workings of evolution by natural selection. This has been seen as essential to grounding teleological organization in a way that is non-arbitrary and non-derivative which is important for the uses to which Teleological

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[40] Godfrey-Smith mentions bee colonies as collections of organisms that he takes to satisfy at least the reproductive conditions he puts on Darwinian Populations (2009, 119) and acknowledges that some individuals in tight symbiotic relationships, like lichens and the different types of individual bacteria that lead to the evolution of the eukaryotic cell, might also constitute Darwinian Populations (Godfrey-Smith 2009, chap. 4).

Individualism is put. The trouble for the view arises because insufficient attention has been paid to the relationship between grounding the teleology of individual organisms and the issue of the levels of selection. Once we recognize that there is such a relationship, we see that there is little space for Teleological Individualism. Individualists must either find some new defense of Reductionism or find a new way to ground teleology consistent with the constraints of Non-Arbitrariness, Non-Derivativeness.

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