Cultural Evolutionary Theory and the Significance of the Biology-Culture Analogy

Shaun Stanley¹

Abstract
Throughout the literature on Cultural Evolutionary Theory (CET) attention is drawn to the existence and significance of an analogy between biological phenomena and socio-cultural phenomena (the “biology-culture analogy”). Mesoudi (2017) seems to argue that it is the accuracy of the analogy, and the magnitude of accurate instances of this analogy at work, which provides warrant for an evolutionary approach to the study of socio-cultural phenomena, and, thus, for CET. An implication of this is that if there is evidence to suggest that the analogy is not accurate, or that there aren’t many cases where it is accurate, this would constitute evidence to reject an evolutionary approach to the study of socio-cultural phenomena. As such, opponents of CET raise objections highlighting the weakness of the biology-culture analogy. These objections, in turn, have standard replies in the literature that serve to reinforce the realism of the biology-culture analogy. Curiously, this situation would appear to support a position in the philosophy of social science called “Ontology Matters” (Lauer 2019). It is the view that social ontology can contribute to the empirical success of the social sciences (among which I include CET) by providing an accurate account of what there is in the domain of the social world which can be used to generate better explanations and/or predictions of social phenomena. If

¹University of Bristol, Bristol, UK

Corresponding Author:
Shaun Stanley, Department of Philosophy, University of Bristol, Cotham House, Bristol, BS6 6JL, UK.
Email: shaun.stanley@bristol.ac.uk
ontology matters, in this sense, perhaps this can help to clarify and resolve the dispute regarding the realism of the biology-culture analogy. In turn, perhaps this can help us determine what warrant there is for CET. However, I think this situation is indicative of severe confusion and misunderstanding as to the significance of the biology-culture analogy. This confusion is caused by inattention to two things. First, the useful distinction between it’s methodological, epistemological, and ontological significance. Second, the abstract (ontologically minimalist) nature of Darwinian evolution by natural selection. By drawing attention to these two things, I hope to take the sting out of, and deflate the significance of, disputes regarding the accuracy of the analogy, for both proponents and opponents of CET, as well as to bring into contact a classical dispute in the philosophy of social science with some relevant aspects of theoretical biology.

Keywords

Cultural evolution, social ontology, evolutionary theory

1. Introduction

Section 2 covers some background regarding Cultural Evolutionary Theory (CET) as well as a basic sketch of the problem regarding the biology-culture analogy. Section 3 covers some more nuanced detail about CET and provides the necessary background for introducing the biology-culture analogy. Section 4 describes the first piece of the puzzle by detailing the biology-culture analogy and goes into some detail regarding the nature of disputes about its significance and accuracy. The conclusion here is that, for both proponents and opponents “ontology matters.” Section 5 briefly discusses the position that “ontology matters” by elucidating Lauer’s instructive treatment of the matter. The conclusion here is the same as that of Section 4, but from the point of view of social ontologists. Section 6 discusses the nature of Darwinian evolution by natural selection. The conclusion here is that Darwinian evolution by natural selection is ontologically minimalist (requiring no specific type of mechanisms or specific kinds of entities) and multiply realizable, and the implication of this is that, in the strict sense of the previous two sections, ontology does not matter. Section 7 sees a presentation of the puzzle (effectively: the incongruence between the conclusions of Section 4, and 5, on the one hand, and Section 6, on the other hand). I present two bold claims which jointly solve the problem presented by this puzzle. The first claim relates to reconceiving the nature of the analogy (drawing it between, on the one hand, abstract Darwinian processes, and, on the other hand, the realization of these processes by biological or cultural systems, themselves dissimilar, and with
The second claim relates to reconceiving the significance of the analogy by paying attention to the tripartite distinction between it’s methodological, epistemological, and ontological significance. I conclude that the analogy is methodologically, and perhaps epistemologically, significant, but not ontologically significant. Finally, I bring the discussion to a close in the final Section offering some conciliatory remarks.

2. Background

What is the relationship between CET—a Darwinized approach to the study of human culture, more on which later—and traditional non-Darwinian social science? There are a variety of potential answers to that question. Some argue that these two fields do not have any special relationship, that they are theoretically irrelevant to each other. Various social scientists (Bryant 2004, cf. Mesoudi et al. 2010), prominent philosophers (Dupré 2001; Dupré and O’neill 1998 Sober 2006) humanist scholars (Downes 2018; Fracchia and Lewontin 2006) and scientists (for example, the series of letter exchanges between David Sloan Wilson and Massimo Pigliucci1) have advocated for this position, in one or another form.

My focus here will be with proponents of this view. Proponents of this view are concerned with the very notion that there is some similarity, or analogy, to be found between cultural and biological phenomena. Their view is that there is no such similarity, or that the similarity is so fleeting as to be unimportant, and on these grounds reject that there might be any special relationship between CET and non-Darwinian social science. What I aim to demonstrate is that this position is founded on some confusion regarding the nature and significance of the alleged analogy between cultural and biological phenomena, a confusion, as I will at length demonstrate, perpetuated by proponents, and opponents, of this view, philosophers and scientists alike.

Here is a brief sketch of the problem. Scholars have tended to think that the true test of this analogy is whether or not socio-cultural phenomena are similar to biological phenomena. This is a mistake. The relevant test is whether, like biological phenomena, socio-cultural phenomena are abstractly Darwinian. I call this a puzzle, as opposed to a basic error, because this mistake is generated, I think, by interdisciplinary misunderstanding and miscommunication, and I think there is some value in detailing how that has occurred, in order to help us all avoid these mistakes in our future scholarship. Rather

1Sloan Wilson and Pigliucci (2019), On Human Cultural Evolution [https://letter.wiki/conversation/34]
than an attempt to highlight a series of problems, this is an attempt to solve a puzzling state of affairs.

On one hand, various scholars think that “ontology matters” (more on which later) and that it’s theoretically significant to determine whether or not socio-cultural phenomena are ontologically like biological phenomena. On the other hand, as I’ll demonstrate in Section 6, theoretical biology tells us that ontology doesn’t really matter since, as I’ll explain, Darwinian evolution by natural selection is multiply realizable and ontologically minimalist. I’ll argue that solving this puzzle requires us to do two things. First, to appreciate the analogy as between abstract Darwinian processes on the one hand, and their realization in two non-identical, but relevantly Darwinian, systems. Second, to appreciate that the analogy is methodologically (and perhaps epistemologically) and not ontologically significant. Much has been said in this brief sketch which I will now expand on and clarify.

3. A Taxonomy of Positions on the Culture Concept

There are significant differences between cultural macroevolution and cultural microevolution. So, rather than describing what the subject matter of CET is as a whole, we will focus on the subject matter of cultural microevolution. The study of cultural evolution involves the study of changes in patterns of “cultural expressions” (whatever these may be) within and across societies (populations of individuals) over time by means of “social transmission.” “Social transmission” refers to the process by which individuals are induced by their psychological mechanisms (whatever these may be) toward or against the uptake of variants of “cultural expressions” they witness others performing (Cf. Creanza et al. 2017; Mesoudi et al. 2006). This I call the “Neutral Account” of cultural (micro)evolution: it is non-specific regarding the nature of “cultural expressions” and non-specific regarding the causal mechanisms by which “cultural expressions” will change in frequency in populations over time.

Two types of “idiom” can overlay the Neutral Account. They give us different ways to speak about the process of cultural evolution. These different ways of speaking are indicative of different ontologies regarding the nature and causal structure of cultural evolution. I label these idioms under two broad headings: Biological and Behavioristic. There are three different accounts which utilize a Biological idiom, and one account which utilizes a Behavioristic idiom.

Each of the accounts using the Biological idiom are so labeled because they regard “cultural expressions” as replicators, analogous (however
strongly, weakly or abstractly) to genetic replicators. There is the Memetic Account, favored by Dennett (2017), Rosenberg (2017), and Blackmore (1999), according to which “memes” should be viewed as cultural replicators. There is the Ideational Account, favored by Richerson and Boyd (2005) and Mesoudi et al. (2006), according to which “ideas in individuals heads” (more specifically, ideational information, potentially neuronally encoded), or, more simply, “ideas” should be viewed as cultural replicators. There is the Dispositional Account, favored by Hodgson and Knudsen (2010), according to which “habits”—roughly speaking, behavioral dispositions acquired through repetition which accompany mental dispositions (habits of thought) similarly acquired—or more simply “dispositions” should be viewed as cultural replicators.2

The Memetic Account, Ideational Account, and Dispositional Account each provides an interpretation—an ontology and a causal structure—for the Neutral Account. Whatever these accounts consider to be the nature of “cultural expressions” (“memes,” “ideas” or “dispositions”) will be likened (however strongly, weakly, or abstractly) to genes. Populations of individuals in which these gene-like entities inhere will exhibit variations in the sense that different individuals will possess different memes, or ideas, or dispositions. These gene-like entities will “replicate” (analogous to genetic replication in some way) at different rates giving them different fitnesses in their given environments. These replication events may be construed as indicative of the heritability of the cultural expression. So, in considering “cultural expressions” as “cultural replicators” we can give the Neutral Account a biological spin. The “change in patterns of cultural expressions” may be reinterpreted as changing frequencies of gene-like entities in a population, and this may be explained as a consequence of “natural selection,” or its cultural analogue.

In contrast the Behavioristic idiom, under which we find what I call the Behavioral Account, does not preserve the analogy between culture and biology. So, it furnishes the Neutral Account with an ontology and causal structure quite different to that of the different accounts under the Biological idiom. According to the Behavioral Account “cultural expressions” are to be understood as the content of individually possessed cognitive states (neuronally

---

2This taxonomy is a simplification of the vast heterogeneity of views within the literature. It is intended to bring that heterogeneity into some neat order, generally agreeable to evolutionary theorists, and good enough for the purposes of my arguments here. Note also that there are hybrid accounts, such as that presented by Tamariz (2019). Though simplified, this taxonomy covers a reasonable amount of ground for our purposes here.
encoded) or behavioral expressions (potentially arising from these cognitive states), or both. We are to emphasize the second of the disjunctive options as the main focus: behavioral expressions. As such, on this account, cultural expressions (read: behaviors) are taken up or not by individuals as a causal consequence of their psychological biases (like prestige bias, or conformity bias), which is all that “social transmission” amounts to.

Each of these accounts is “abstractly Darwinian” in that they satisfy Lewontin’s 1985 summary of the sufficient conditions for a population to undergo evolution by natural selection (Godfrey-Smith 2009, 18). Lewontin tells us that there are three conditions (or principles, as he terms them) which if met will allow a population to undergo evolution by natural selection. First, the principle of variation: there must be some phenotypic variation among the members of the population. Second, the principle of heredity: this variation is heritable in the sense that offspring will resemble their parents with respect to such variation more than they will resemble non-parents. Third, the principle of differential fitness: different variants leave different numbers of offspring either in immediate or remote generations. For brevity, a population will undergo evolution by natural selection when it exhibits variation, differential fitness and heritability.

To summarize, the Neutral Account tells us, in ontologically and causally neutral terminology, what the study of cultural evolution is about. This Neutral Account can be supplemented, in terms of its ontic commitments and its implied causal structure, by either of four accounts, which fall into two general groups. One general group is termed the Biological Idiom, in which we adopt a linguistic scheme whereby the ontic and causal commitments of cultural evolution are seen as (to some or other degree, in some or other way) analogous to biological evolution. Under this group we find the Memetic, Ideational and Dispositional Accounts. The second general group is termed the Behavioristic Idiom, in which we adopt a linguistic scheme whereby the ontic and causal commitments of cultural evolution are seen in more proximately mechanistic ways, regarding psychological mechanisms and causally resultant behaviors (liberally understood). Each of these accounts are abstractly Darwinian, but only accounts under the first group have pride of place for a strong analogy between biological and cultural processes. Adherents of accounts in the first group believe that the biology-culture analogy is very significant with respect to CET, but adherents of the account in the second group believe that the analogy is theoretically dispensable and, thus, less significant for CET than ordinarily thought. Thus stands some background information regarding what CET is, and to show that, somehow or other, the Biology-Culture analogy plays a role within CET. Next, I turn to the first piece of the puzzle.
Table 1. Consider this Reproduction of the Biology-Culture Analogy (Mesoudi 2017, 7854).

| Process     | Genetic evolution      | Cultural evolution                              |
|-------------|------------------------|-------------------------------------------------|
| Variation   | Genetic mutation, recombination | Undirected cultural mutation/invention, recombination, guided variation or transformation |
| Inheritance | Particulate, vertical (parent to offspring), horizontal gene transfer | Particulate or “meme-like,” blending of continuous cultural variation, vertical cultural transmission, horizontal/oblique cultural transmission |
| Selection   | Natural selection      | Cultural selection or direct/content biases, frequency dependent biases (e.g., conformity), indirect (e.g., success, prestige) biases |
| Migration   | Gene flow              | Demic diffusion (movement of people with their cultural traits), cultural diffusion (movement of traits without people) |
| Drift       | Genetic drift          | Cultural drift                                  |

4. The Biology-Culture Analogy—Puzzle Piece I

Proponents of CET, especially those who prophesize about its significance for the non-Darwinian social sciences, emphasize the significance of this analogy. For example, Mesoudi says:

“This question comes from both social scientists skeptical of any kind of parallel with evolution, and biologists insistent that Darwin’s theory applies only to genetic evolution. Importantly, no one argues that genetic evolution and cultural evolution operate identically. From the outset, microevolutionary modelers incorporated processes unique to culture change, such as one-to-many transmission or nonrandomly guided variation. However, an examination of (Table 1) indicates that the parallels are numerous enough to warrant an evolutionary theory of culture, as long as these differences are taken seriously.” (Mesoudi 2017, 7854) (emphasis added)

Opponents of CET make similar remarks, also highlighting the significance of the analogy. For example, Bryant says:

“...Buoyed by the progress that has occurred in these biology-based disciplines, proponents of the “selectionist” paradigm now herald the dawn of comparable breakthroughs in the study of sociocultural phenomena. Is this enthusiasm warranted?... what is resisted is...the subrogating biological colonization of
the sociological disciplines, as this is pursued through efforts to remodel cultural developments in accordance with the logic of natural selection. . . as the proposed biology-to-sociology conceptual transfer logically requires that relevant entities and processes in the two ontological domains exhibit homologies, isomorphisms, and analogues that are systemic and substantial, as well as specifiable with theoretical precision. Even a cursory glance at the inventory of alleged “correlates and parallels” disclose that no such correspondence has been established. . . (Bryant 2004, 459f) (emphasis in the original)

Mesoudi has expressed similar sentiments elsewhere, as have other scholars favorable, or opposed, to the extension of CET and its methods to the non-Darwinian social sciences. If we take him at is word, and Bryant would agree with this, what this indicates is that it is the accuracy of the analogy, and the magnitude of accurate instances of this analogy at work, which provides warrant for an evolutionary approach to the study of socio-cultural phenomena. A logical implication of this is that if there is evidence to suggest that the analogy is not accurate, or that there aren’t many cases where it is accurate, this would constitute evidence to reject an evolutionary approach to the study of socio-cultural phenomena.

This is exactly what opponents try to argue for. As a brief illustration of the situation in much of the literature we can consider five objections raised by Gabora (Gabora 2011), each highlighting some alleged dissimilarity between cultural and biological phenomena.³ The first is that while genes are particular and discrete mental representations (ideas, or memes, or dispositions) aren’t (Gabora 2011, 62). Secondly, there is no objective way to model cultural fitness analogously to biological fitness (Gabora 2011, 73f). Thirdly, there are no cultural replicators analogous to biological replicators. Fourthly, cultural change is often the consequence of creative and contemplative thought, which any Darwinian account must, objectionably, downplay (Gabora 2011, 70ff). Fifthly cultural traits, unlike biological traits, do not vary randomly but are often taken up, or discarded, as the result of foresighted deliberation (Gabora 2011, 75f). Each of these kinds of objections has responses in the literature (see, respectively, Dennett (2017); Mesoudi et al. (2006); Ramsey and De Block (2017); Smaldino and McElreath (2016); Tamariz (2019)).

But for other examples, consider Fracchia and Lewontin (2006), who emphasized the great complexity, contingency, and nuance to the history of human societies and the very sterile analogy this has with biological evolution in their stark rejection of evolutionary approaches to culture. Or consider why Dupre highlights the paucity of describing culture (in the thick sense used by cultural anthropologists) as some kind of adaptation—because, in his

³For a similar, though perhaps more expansive, series of criticisms see (Bryant 2004)
view, culture is too *unlike* other biological adaptations to be given justice by treating it as analogous to one (Dupré and O’neill 1998).

Each of these objections exploits some or other disanalogy between biological and cultural evolution in order to invalidate an evolutionary approach to the study of socio-cultural change. Of course, the standard replies in the literature serve to reinforce the realism of the analogy. This scholarly effort is exhibited, I submit, because it is widely thought that the accuracy of the analogy is what warrants an evolutionary approach to socio-cultural change.

This is noted by Gray (Gray et al. 2007).

“Broad analogies between biological evolution and cultural change have not been sufficient to convince skeptics. . .that anything of substance or utility can come of such parallels. . .Current debates about Darwinizing culture typically focus on the problems with the analogies between biology and culture: (1) Does culture have particulate units of inheritance (memes, [ideas, dispositions]) analogous to genes? (2) are memes [, or ideas, or dispositions] inherited with sufficient fidelity to enable cumulative selection?” (Gray et al. 2007, 361)

In summary, the literature on CET is replete with disputes about the significance of the biology-culture analogy. This is because many scholars regard the strength and accuracy of the analogy as providing theoretical warrant for an evolutionary approach to the study of culture and cultural change. To put this in terms relevant for this paper, and to reveal the first piece of the puzzle, scholars in this literature are concerned to uncover the right ontology of socio-cultural phenomena, they want to uncover whether socio-cultural phenomena are relevantly like biological phenomena, and see this as significant for the warrant we have to study socio-cultural phenomena using evolutionary methods. To put it in a phrase, ontology matters according to proponents and opponents of CET. I will now turn to briefly discuss Lauer’s view regarding social ontology, which will be the second piece of the puzzle.

5. Ontology Matters—Puzzle Piece 2

Lauer (2019) considered “ontology” to be an activity in which one asks and answers “ontological questions.” The questions are inquiries about what there is, either generally, or in some circumscribed sense, in some domain of the form “are there F’s?” (and variants of this question like “are G’s F’s?”, and so on). The answers are affirmative or negative of the form “something is an F” or “nothing is an F” (and so on for the variations of the standard ontological question) (Lauer 2019, 181). “Social ontology” falls out as a special case of ontology, asking ontological questions with respect to the domains studied by the social sciences.
What is in question is whether social ontology, thus conceived, can somehow contribute to the empirical success of the social sciences. In line with Lauer’s terminology, a position which we can call “Ontology Matters” (OM), is that social ontology, thus conceived, can contribute to the empirical success of the social sciences. Lauer shows that there are two distinct ways in to approach social ontology, either as a realist, or as a pragmatist.

Realists view answers to ontological questions as really telling us what there is in some domain, and, by virtue of these discoveries, such answers can help generate more accurate explanations and predictions. Pragmatists, in distinction, suggest instead that answers to ontological questions can introduce statements from which new inferences to explananda, or predicted phenomena, can be drawn (Lauer 2019, 180). That is, on the pragmatic view, one ontology rather than another is selected not in virtue of its greater fit with an external reality. Rather, some ontology is selected over another in virtue of its utility in allowing us to draw such inferences and their capacity to generate better explanations and/or predictions of phenomena (Lauer 2019, 183).

We are now in a position to reveal the second piece of the puzzle. Whether one is a realist or a pragmatist, some philosophers of social science find a meeting of minds with proponents and opponents of CET. My sense is that proponents and opponents of CET are more likely to be realists. What seems to matter is whether or not the entities under investigation are really like biological entities. Were we to enforce pragmatism, I suspect that proponents of CET would argue that adopting a (let’s call it) “Darwinian language” is useful because cultural entities really do exhibit the relevant properties. And, I suspect that opponents would find the “Darwinian language” to be relatively useless because the entities under investigation don’t really exhibit the relevant properties, in their estimation, as in the case presented by Bryant. My aim is not to adjudicate whether pragmatists or realists are right, or how we ought to conceive of ontological questions for CET. My aim, for the moment, is simply to show an interesting parallel between a position in Social Ontology, that “ontology matters,” and a dispute within the literature on CET. Were social ontologists to concern themselves with CET, they, like proponents and opponents of CET, would have to agree that “ontology matters,” in one sense or another. I will now turn to the third piece of the puzzle.

6. Darwinian Evolution by Natural Selection, Ontological Minimalism and Multiple Realization—Puzzle Piece 3

Let us consider what Dennett (1996) tells us about Darwinian evolution by natural selection. He considers the evolutionary process to be algorithmic,
and of algorithms, he highlights three features, the first of which is of significance here.

“Three key features of algorithms will be important to us. . .(1) Substrate neutrality. . .the power of the procedure is due to its logical structure, not the causal powers of the materials used. . .(2) underlying mindlessness. . .(3) guaranteed results. . .” (Dennett 1996, 51) (emphasis added).

This brings to mind one of the central features of functionalism, in the sense relevant to the Mind-Body problem, which is the multiple realizability of mental states. Roughly speaking, mental states were constituted by their functional roles, with respect to inputs, outputs, and other mental states. Mental states, thus abstractly conceived, could in principle be realized by, or instantiated in, many different, and non-identical, systems, just so long as the system exhibited the relevant (abstract) functional roles. Functionalism, thus, provides us a picture of mental states which is ontologically minimalist (nothing but the abstract structure is required) and multiply realizable. When we attend to some details from theoretical biology, we find that Darwinian evolution by natural selection should be thought of similarly, as ontologically minimalist and multiply realizable.

Recall Lewontin’s formulation of the three conditions, or principles, which, if satisfied, will allow a system to evolve by natural selection. There must be phenotypic variation such that different individuals in a population exhibit different phenotypes. Secondly, there must be differential fitness in the sense that different phenotypes have different rates of survival and reproduction in different environments. Thirdly, this fitness must be heritable in the sense that there is a correlation between parents and offspring in the contribution of each to future generations (Lewontin 1970, 1).4

Notice the generality of these formulations. No specific kinds of entities, or specific kinds of phenotypes are mentioned regarding the first principle; any entities exhibiting any phenotypes will do. There is no specific reason or mechanism which is required to account for differential fitness; any will suffice. And there is no specific mechanism which is required for heritability; any mechanism by which parent-offspring pairs correlate with respect to fitness producing phenotypes will do.

As a further illustration, consider what Lewontin himself says,

“The generality of the principles of natural selection means that any entities in nature that have variation, reproduction, and heritability may evolve. For

4Godfrey-Smith’s account of “Darwinian populations in the minimal sense” mirrors this (Godfrey-Smith 2009, 39)
example, if we replace the term “individual” with the term “population” and interpret “phenotype” to mean the distribution of a phenotype in a population, then principles 1, 2 and 3 describe a process by which one population may increase its proportional representation in the species relative to other populations” (Lewontin 1970, 1f) (my emphasis).

Lewontin goes on to describe how natural selection can occur at multiple different levels, with respect to different units, whether these are molecules, cell organelles, cells, gametes, individuals, or populations. Those examples concern biological entities, but it is clear that, in principle, any population of entities which exhibited the relevant properties, biological or otherwise, could be subject to natural selection. What theoretical biology tells us, in other words, is that Darwinian evolution by natural selection is an ontologically minimalist and multiply realizable process. This is the third piece of the puzzle. Because Darwinian evolution by natural selection is ontologically minimalist and multiply realizable, its operation does not require any specific mechanisms or any particular kinds of entities.5

7. Puzzle: The Biology-Culture Analogy and its Significance

We are now in a position to fully appreciate the puzzle surrounding the biology-culture analogy within CET. On the one hand we have scientists and philosophers for whom ontology matters. For those scholars, finding out whether or not socio-cultural phenomena are really like biological phenomena is very significant. On the other hand, from theoretical biology, we find that ontology doesn’t matter. Whether or not socio-cultural phenomena are really like biological phenomena is, theoretically, unimportant. Because Darwinian evolution by natural selection is multiply realizable and ontologically minimal, those ontological questions don’t matter with respect to the warrant for CET. How can this puzzle be solved? I will go on to present my solution with two bold claims.

From a reading of the literature it is clear that proponents and opponents of CET, often anyway, appear to think the relevant analogy is between the processes described in the middle and right most columns. That is, they have been concerned to find an analogy between biological and socio-cultural phenomena and processes. This is what accounts for the various objections by

---

5 This is, of course, in line, and a partial vindication of, what is, in contemporary literature, sometimes referred to as “Generalized Darwinism.” See Baraghith (2020) for a recent discussion on this matter in relation to the concept of “populations” in Generalized Darwinism.
dianalogy I mentioned earlier, as well as Gray’s et al (2007) observation regarding the dispute.

My first bold claim, then, is that this is indicative of confusion regarding the nature of Darwinian evolution by natural selection. The appropriate analogy is, rather, between, on the one hand, abstract Darwinian processes (left column) and socio-cultural phenomena (right column), and, on the other hand, abstract Darwinian processes and biological phenomena. That is, the ontologically minimalist process of evolution by natural selection can be realized by biological systems and by cultural systems, not because the two systems are alike, but because they both exhibit the relevant Darwinian properties of phenotypic variation, differential fitness, and heritability. The mistake here, or, at least, the misleading move, is the apparent attempt to model the cultural evolutionary mechanisms as being in close correspondence with the biological evolutionary mechanisms. These mechanisms don’t have to be similar, or analogous, or even to correspond in some one-to-one like manner; the mechanisms can be substantially different.

One may wonder why such a mistake is made, and, to make my second bold claim, I believe that it is made by a failure to attend to the tripartite distinction between the methodological, epistemological, and ontological significance of the analogy. But before attending to that, let us recapitulate how things may appear from Lauer’s perspective. Lauer—or, at least, Searle, Epstein, and other ontologists—thinks that scientific methodologies come with, or are in some way associated with, ontologies. This is partially correct if we consider “scientific methodologies” to refer to what might more descriptively be called “research strategies.” But consider, for example, that models of biological processes are often presented in terms of difference or differential equations. The reason for this is that biological processes involve changes through time and space (Allan 2007, 1). I think it is a methodological decision to use these sorts of mathematical techniques, but it is not an ontologically weighty one—not of the sort which would interest ontologists, anyway—for all this really suggests is that biologists take their domain of inquiry to be non-static.

On the other hand, consider the shift from “typological thinking” to “population thinking.” One might view the natural world as containing discrete kinds, or types, or species, with their own unique individuating features, or essences. If viewed in this way then the variations among individuals within populations will seem either theoretically unimportant or problematic; facts to be explained, perhaps by alterations of the specification of the types, or otherwise explained away. In contrast to this “typological thinking” one might adopt “population thinking,” which emphasizes the variation among individuals within populations as chiefly significant for evolution, and which
regards population-wide characteristics as abstractions or inessentially contingent (Godfrey-Smith 2009, 11f).

I think of “population thinking” as more like a “research strategy.” It is ontologically weighty and methodologically prescriptive—it leads researchers to view their domain of inquiry in a certain way as the result of what there allegedly is in their domain—there are just collections of individuals, grouped contingently by exogenous forces like history or shared ancestry. What Lauer—and Searle, Epstein and other ontologists—really think, and rightly so, is that these so called “research strategies” come with associated ontologies.

Having had this insight Lauer suggests that there are two sorts of questions we might ask about these research strategies. One is to ask if we should select that research strategy because it comes with an accurate ontology. Another is to ask if we should select that strategy, independently of the accuracy of its ontology, because it is empirically useful to do so. In answering “yes” to the first question one adopts a realist position. In answering “yes” to the second question one adopts a pragmatic position. Taking the realist position maps out the task for ontology—to use whatever philosophical techniques there are to develop an accurate view of the world—and sees the completion of this task as “prior to” scientific methodology. Taking the pragmatic position, on the other hand, unburdens philosophers of having to develop an accurate view of the world and allows philosophers and scientists to consider more humbly which view of the world is most empirically useful. Ontology, in this pragmatic sense, then also remains “prior to” scientific methodology, but just in the sense. Such is the way of conceiving of ontology in the disputes discussed by Lauer.

But I think this is to get started on the wrong foot. As Marvasti (Marvasti 2004, 9) recognizes, our selection of one or another methodology (or “research strategy”) should be made for pragmatic reasons. We should adopt a methodology because it will (or because of the hope that it will) work and, thereby, be empirically useful. In this sense I am sympathetic with Lauer’s pragmatism. The problem is this: that a methodology works, or is hoped to work, is not independent of the external reality investigations conducted using that methodology aim to illuminate. The sharp division between pragmatism and realism is not fully appropriate here.

This is what motivates me to think about the relationship between ontology and methodology in a somewhat different way. I think it is better to consider a three-tiered distinction between methodology, epistemology and ontology. Methodological concerns relate to the theoretical and technical apparatus, and the procedures one uses in the conduct of their work. These include abstract issues like modelling techniques, statistical procedures,
sampling procedures, and more concrete issues like experimental design, questionnaire design, and so on. In simpler terms, the things which have methodological significance answer questions about how one should think about and investigate one’s subject matter. Epistemological significance relates to the means by which empirical knowledge is gained regarding that subject matter. By this I mean to refer to the content and quality of the results obtained through studies conducted with those methodological choices. More simply, things which have epistemological significance answer questions about what those investigations, given those methods, tell us. Ontological concerns relate to the existential, or causal, commitments a successful theory, or set of models, or set of explanations, warrant us to make with regards to the phenomena under investigation. That is, ontological concerns refer to what the results of our investigations tell us about the ontology and causal structure of the phenomena under investigation. More simply, we can get at these through answers to questions about what the results of our investigations tell us about the nature of our subject matter.

This differs substantially from the pursuit of analytic ontology, as defended by Searle and Epstein and elucidated by Lauer. For Searle and Epstein ontology is an activity—potentially an a priori activity—the purpose of which is generate an accurate view of some domain of inquiry and, thereby, aid scientists in selecting the appropriate method to investigate that domain. For Lauer, insofar as he adopts pragmatism, ontology is an activity of explicating useful languages with which scientists can conduct empirically fruitful research. But on my view, with respect to this three-tiered distinction there is no relationship of priority, but rather a looping relationship. Methodological decisions inform the results of our inquiries, which in turn inform us about ontological concerns, which in turn inform us about the utility of our methodological decisions, on and on.

With this in mind, let us return to our considerations regarding the significance of the biology-culture analogy. The literature demonstrates that researchers are confused about the significance of the biology-culture analogy. They have thought that its significance is, or perhaps must be, ontological. But we can dispel this confusion once we accept that the strength of the analogy is not what warrants the use of evolutionary methods. Rather, it is the utility of those methods in uncovering new data or providing successful explanations of phenomena which provides the warrant for the use of evolutionary methods.

This also gives us some insight regarding the epistemological significance of the analogy. It is the quality of the results we obtain through our studies using these methods which determines the utility of these methods and which, in turn, warrants our use of these methods in the first place. My reference to
the “quality” of results is vague, but I roughly mean to refer to strength of the stock of knowledge, the reliability, these explanations give us. In my estimation there are many such successful explanations given to us within CET. But absent a more principled account of “theoretical success,” or “epistemic reliability,” it will suffice to draw a conditional conclusion on this point. If studies conducted using evolutionary methods are empirically or theoretically successful in this way, then the analogy is given epistemological significance. This, in turn, is what might provide further warrant to use these methods.

So, my second bold claim is that the biology-culture analogy is primarily of methodological significance—it gives researchers the capacity to pursue the study of socio-cultural change using methods from evolutionary biology. The use of these methods is warranted not by the accuracy of the analogy but by the empirical and theoretical success of the studies which are conducted using those methods. The secondary significance of the biology-culture analogy, then, is epistemological—insofar as researchers can increase our stock of knowledge through these studies, they are given epistemological warrant to adopt the relevant Darwinian idiom in order to use such evolutionary methods. And, finally, that the biology-culture analogy is not ontologically significant; socio-cultural phenomena are substantially different from biological phenomena, and this is not a problem for CET. I believe that this is a more sensible view regarding the significance of the biology-culture analogy. In taking care to observe the three-tiered distinction between methodological, epistemological, and ontological significance we have arrived at a clearer understanding of the significance of the biology-culture analogy.

My attention has been helpfully alerted to a potential lingering worry regarding the ontological significance of the analogy with respect to matters of realism. It may be that cultural systems exhibit the relevant Darwinian properties, but surely one should be concerned to uncover exactly what the nature of that exhibition is. In terms of the multiple realizability of Darwinian evolution, as I earlier put it, surely it matters to uncover the nature of the “realizers” which constitute the just mentioned cultural systems. If this is the case, how does this square with the rather pragmatic position I have taken regarding the biology-culture analogy?

I think this concerns what one takes to be the scope of CET, and its relationship with other social sciences. That is a question I do not have scope to fully address, but I can briefly say that there are many researchers who see

---

6See, for example, Boyd and Richerson (1992), Henrich and Boyd (2001), Molleman et al (2013), Bender and Beller (2013), Fessler et al (2014), Smaldino and McElreath (2016).
the potential for a cooperative relationship. Smaldino and McElreath (2016), for example, supplement their highly abstract models of cultural evolution with, essentially, psychological, and historical data to provide a more holistic and accurate illustration of their domain of inquiry. In such cases one might suggest that the psychologists and historians had uncovered and detailed the nature of the “realizers” which constitute the cultural systems under investigation.7

In this way, even when taking a pragmatic approach to the use of the biology-culture analogy, this does not threaten those who are more concerned about the concrete nature of different cultural systems—there can be, and in fact often is, a good division of labor between cultural evolutionary theorists and other social scientists, and philosophers concerned with those matters should be free to attend to that information.8

Acknowledging this does not, I believe, threaten the looping relationship I have described between methodology, epistemology, and ontology. Smaldino and McElreath, much like other cultural evolutionary theorists, are interested in Darwinian systems, and the formal tools used to investigate them, and they consider cultural systems to fall within their domain of interest. Thus, they utilize the biology-culture analogy in the formation of models of cultural evolution. In turn they adjust the specification of their models to accommodate new data—data which may in fact point more sharply at the concrete nature of the cultural system being investigated. These models don’t say much more about the ontology of the cultural systems beyond highlighting and possibly confirming their Darwinian nature. This, in it’s own right, is

7The details of their study aren’t germane to my argument, but for the sake of completeness the cultural system under investigation there was “science.” “Science” can be viewed as, among many other things, a cultural activity engaged in by a community of people—scientists. Scientists conduct research using various methods and techniques, some of which are better suited than others at achieving their aims which we may imagine are the discovery of truths or approximate truths about their subject of study (Smaldino and McElreath 2016, 6). Smaldino and McElreath suggest that “science”—specifically, the methods and techniques used by scientists—changes through evolutionary processes. Because their focus is on scientists (that is: people) as opposed to some abstract, or mathematical, representation of the methods they may use, I think it is right to say that, even more specifically, they were concerned with the method-wise behaviors of scientists. So, the method-wise behaviors of scientists change through evolutionary processes (of variation and selective retention) and, in this way, “science,” the cultural activity, evolves.

8This, of course, will not give much satisfaction to philosophers who think ontology can or must be done a priori. I am not such a philosopher but arguing for this naturalistic approach is beyond the scope of this paper.
important, for it shows, at a population-level of analysis, the evolutionary
dynamics of cultural systems which cannot easily be shown without the relevant Darwinian tools. Getting clear on the concrete nature of those systems must, perhaps, be done using other tools—perhaps, as in Smaldino and McElreath’s case, supplementary information taken from studies in psychology and history would be more useful on that score. And all of this goes to show that the significance of the biology-culture analogy is not ontological, and doesn’t have to be, in order for cultural evolutionary theorists to do good and interesting work.

One advantage of this view is that it can help to take the sting out of disputes regarding the accuracy of the analogy from both sides. Social scientists need not be concerned that the nature of their subject matter is being distorted to fit an unsuitable mold, for the significance of the analogy isn’t ontological. Rather than expounding on the disanalogies between biology and culture, skeptical social scientists may instead consider the utility of explanations in evolutionary terms, bearing in mind that such explanations can always be, as it were, translated into a less biological idiom. Cultural evolutionary theorists also need not be concerned that other researchers have found the analogy less (ontologically) compelling than they have (if, indeed, they have found it thus compelling)—for this is not really much of a concern. Given the explanatory success of studies in CET, there are reasons independent of the ontological significance of the analogy to adopt, or at least to utilize and explore, evolutionary methods in dealing with socio-cultural phenomena.

In summary, the puzzle that I have presented is that, on the one hand, the literature would suggest that ontology matters with respect to the similarity between biological and socio-cultural phenomena. On the other hand, theoretical biology would suggest that ontology does not matter in this way. I have made two bold claims which I believe solve this puzzle. The first is that many scholars have incorrectly appreciated the nature of the analogy. The analogy is properly thought of as between abstract Darwinian processes on the one hand, and their realization in two non-identical, but relevantly Darwinian, systems: those typifying biological phenomena, and those typifying socio-cultural phenomena. The second is that many scholars have made this mistake by inattention to the tripartite distinction between the analogy’s methodological, epistemological, and ontological significance. The analogy is methodologically significant, and I suspect it is epistemologically significant, but it is not ontologically significant.

8. Concluding Remarks

In closing I would like to tie up a number of loose ends. The aim of this paper is to confront the problem posed by the biology-culture analogy and
to settle on the nature of its significance for CET. In order to do this, I have
found it necessary to elucidate on what exactly CET is about. On that
score, I highlighted four different accounts of culture. There is ongoing
debate about which of those accounts is the right one, and I have not aimed
to settle that score here since expressing and defending my two bold claims
did not require me to do so.

The biology-culture analogy often appears to concern matters of ontology:
whether or not socio-cultural phenomena are relevantly like biological phe-
nomena. There is a natural reading of that question as a (specific kind of)
onological question, as discussed by Lauer. Thus, I endeavored to recon-
struct Lauer’s instructive remarks on that score. Lauer argues for a presump-
tive favoring of a form of pragmatism with respect to social ontology. This
interestingly aligns with my own views regarding the biology-culture anal-
ogy. As discussed earlier, one may adopt one or another of the biological
idioms and furnish the Neutral Account of culture with a biological spin. We
both regard this adoption of language as a matter of pragmatic concern.
However, we have arrived at this conclusion via quite different routes. For,
while Lauer suggests this can be done a priori, prior to the development of
scientific methodology, I do not think that is the correct way to view things. I
do not think it is right to have a strict separation between pre-and-post meth-
odological deployment and investigation, for I believe the relationship to be
a looping one, rather than a unidirectional one. Methodological choices are
informed by their utility, and their utility depends on those methods latching,
in the relevant ways, onto the way the world really is. In the case of CET, the
social world really is (assuming that these investigations are successful) such
as to contain cultural “Darwinian populations”; the mistake was to think that
these populations had to closely resemble biological populations. I support
Lauer’s pragmatism, but not it’s a priority, and in the case of CET, I think I
have warrant to view things as such.

My aim, however, was not to adjudicate the dispute on whether or how
“ontology matters.” What my arguments suggest, however, is that,
whether realistically or pragmatically, ontology may matter, in that strict
sense, in some domains of social inquiry, but not in all, with CET, at least,
being an exception. Insofar as the “ontology matters” positions are meant
to generalize to all of social science this poses a difficulty for that
generalization.

In executing the main aim of this paper, I believe I have solved the puzzle
I presented earlier. The analogy is best thought of as between abstract
Darwinian systems and their instantiation in the domains of culture and biol-
yogy, despite their being substantial difference between those domains.
Moreover, the analogy does not have ontological significance, rather, it has
methodological and (I suspect) epistemological significance. My hope is that these results will be advantageous for social scientists, natural scientists, and the philosophers attending to those domains. As remarked earlier, this frees scholars from attending to ever more lofty disputes about the ontological significance of the analogy. It liberates social scientists to use evolutionary methods without thereby compromising their own views as to the nature of socio-cultural phenomena. Similarly, it liberates evolutionary scientists from having to defend their positions against ontological objections. I hope this can help philosophers of science, with respect to our understanding of CET, as well as philosophers of social science, with respect to our understanding of ontology and its intricacies within evolutionary frameworks.

Acknowledgments

I thank the organizers of the Philosophy of Social Science Roundtable 2020, hosted at Emory University, Atlanta, where I presented an earlier draft of this paper, I found the commentary on it immensely helpful. I thank the Philosophy Department at the University of the Witwatersrand, Johannesburg, where I also presented an earlier draft of this paper which received very helpful commentary and support. I thank Professor Fiona Jordan, as well as the other affiliates of the EXCD research group for their extremely helpful comments and support.

Declaration of Conflicting Interests

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

Funding

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

References

Allan, Linda J. S. 2007. *An Introduction to Mathematical Biology*. New Jersey: Pearson Education.

Baragahtith, Karim. 2020. “Investigating Populations in Generalized Darwinism.” *Biology and Philosophy* 35 (19): 1-27. [See note 5]

Bender, Andrea, and Sieghard Beller. 2013. “Mangarevan Invention of Binary Steps for Easier Calculation.” *Proceedings of the National Academy of Sciences* 111 (4): 1322-27.

Blackmore, Susan. 1999. *The Meme Machine*. Oxford: Oxford University Press.

Boyd, Robert, and Peter J. Richerson. 1992. “Punishment Allows the Evolution of Cooperation (or Anything Else) in Sizable Groups.” *Ethology and Sociobiology* 13 (3): 171-95.
Bryant, Joseph M. 2004. “An Evolutionary Social Science? A Skeptic’s Brief, Theoretical and Substantive.” *Philosophy of the Social Sciences* 34 (4): 451-92.

Creanza, Nicole, Kolodny, Oren, and Feldman, Marcus W. 2017. “Cultural evolutionary theory: How culture evolves and why it matters.” Proceedings of the National Academy of Sciences of the United States of America: 1-8.

Dennett, Daniel C. 1996. *Darwin’s Dangerous Idea*. New York: Penguin Books.

Dennett, Daniel C. 2017. *From Bacteria to Bach and Back: The Evolution of Minds*. Penguin Books.

Downes, Stephen M. 2018. “Scientific Imperialism and Explanatory Appeals to Evolution in the Social Sciences.” In *Scientific Imperialism: Exploring the Boundaries of Interdisciplinarity*, edited by U. Maki, A. Walsh, and M. F. Pinto, 224-36. New York: Routledge.

Dupré, John, and John O’Neill. 1998. “Against Reductionist Explanation of Human Behaviour.” *Proceedings of the Aristotelian Society, Supplementary Volumes* 72: 153-88.

Dupré, John. 2001. *Human Nature and the Limits of Science*. Oxford: Clarendon Press.

Fessler, Daniel M. T., Anne C. Pisor, and Carlos David Navarrete. 2014. “Negatively-Biased Credulity and the Cultural Evolution of Beliefs.” *PLoS One* 9 (4): e95167.

Fracchia, Joseph, and R. C. Lewontin. 2006. “Does Culture Evolve.” In *Conceptual Issues in Evolutionary Biology*. 3rd ed., edited by E. Sober, 505-33. Cambridge, Massachusetts: The MIT Press.

Gabora, Liane. 2011. “Five Clarifications about Cultural Evolution.” *Journal of Cognition and Culture* 11 (1-2): 61-83.

Godfrey-Smith, Peter. 2009. *Darwinian Populations and Natural Selection*. Oxford: Oxford University Press.

Gray, Russell D., Simon J. Greenhill, and Robert M. Ross. 2007. “The Pleasures and Perils of Darwinizing Culture (With Phylogenies).” *Biological Theory* 2 (4): 360-75.

Henrich, Joseph, and Robert Boyd. 2001. “Why People Punish Defectors: Weak Conformist Transmission Can Stabilize Costly Enforcement of Norms in Cooperative Dilemmas.” *Journal of Theoretical Biology* 208 (1): 79-89.

Hodgson, Geoffrey M., and Thorbjorn Knudsen. 2010. “Darwin’s Conjecture: The Search for General Principles of Social and Economic Evolution.” Chicago: The University of Chicago Press.

Lauer, Richard. 2019. “Is Social Ontology Prior to Social Scientific Methodology?” *Philosophy of the Social Sciences* 49 (3): 171-89.

Lewontin, Richard C. 1970. “The Units of Selection.” *Annual Review of Ecology and Systematics* 1: 1-18.

Marvasti, Amir B. 2004. *Qualitative Research in Sociology*. Sage Publications.

Mesoudi, Alex, Andrew Whiten, and Kevin N. Laland. 2006. “Towards a Unified Science of Cultural Evolution.” *Behavioral and Brain Sciences* 29 (4): 329-47.
Mesoudi, Alex, Djuke Veldhuis, and Robert A. Foley. 2010. “Why Aren’t the Social Sciences Darwinian?” *Journal of Evolutionary Psychology* 8 (2): 93-104.

Mesoudi, Alex. 2017. “Pursuing Darwin’s Curious Parallel: Prospects for a Science of Cultural Evolution.” *Proceedings of the National Academy of Sciences* 114 (30): 7853-60.

Molleman, Lucas, Ido Pen, and Franz J. Weissing. 2013. “Effects of Conformism on the Cultural Evolution of Social Behaviour.” *PLoS One* 8 (7): e68153.

Ramsey, Grant, and Andreas De Block. 2017. “Is Cultural Fitness Hopelessly Confused?” *The British Journal For the Philosophy of Science* 68 (2): 305-28.

Richerson, Peter J., and Robert Boyd. 2005. *Not by Genes Alone: How Culture Transformed Human Evolution*. Chicago and London: University of Chicago Press.

Rosenberg, Alex. 2017. “Why Social Science is Biological Science.” *European Journal for Philosophy of Science* 48: 341-69.

Wilson, David Sloan and Massimo Pigliucci. 2019. On Human Cultural Evolution [https://letter.wiki/conversation/34]

Smaldino, Paul E., and Richard McElreath. 2016. “The Natural Selection of Bad Science.” *Royal Society Open Science* 3 (9): 160384.

Sober, Elliott. (ed.) 2006. “Models of Cultural Evolution.” *Conceptual Issues in Evolutionary Biology*. 3rd ed. 535-51.

Tamariz, Monica. 2019. “Replication and Emergence in Cultural Transmission.” *Physics of Life Reviews* 30: 47-71.

**Author Biography**

**Shaun Stanley** is a PhD student at the University of Bristol in Bristol, UK. His research is in philosophy of (social) science, and philosophy of biology. His work focuses on understanding the relationship between cultural evolutionary theory, and the rest of the social sciences.