There Is No Asymmetry of Identity Assumptions in the Debate over Selection and Individuals

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A long-running dispute concerns which adaptation-related explananda natural selection can be said to explain. (The issue is conceptual—not empirical—and orthogonal adaptationism.) At issue are explananda of the form: why a given individual organism has a given adaptation rather than that same individual having another trait. It is broadly agreed that one must be ready to back up a "no" answer with an appropriate theory of trans-world identity for individuals. I argue, against the conventional wisdom, that the same is true for a "yes" answer. My conclusion recasts the landscape and opens the door to a potential resolution.

1. Introduction. Natural selection does not explain why any individual organism has any of its traits, not even for traits that are adaptations. This is the unintuitive, even jarring conclusion reached by Elliott Sober in *The Nature of Selection* (1984). (At least this is how Sober's conclusion is typically glossed; see below for a more careful statement.) Sober's reasoning built on ideas from Lewontin (1983) and to a lesser degree Cummins (1975) and Dretske (1981) and quickly ran into objections from Neander (1988, 1995a). The ensuing debate continues today unabated. In this essay, I point to a supposition that has structured the discussion in recent years, and I argue that this supposition is wrong.

The debate-structuring supposition that I seek to undermine is this: that while Sober and subsequent advocates of his position are obliged to shoulder commitments regarding the metaphysics of individual identity, opponents can do without such esoterica. This supposition is mistaken: neither position can do without identity metaphysics. There is, in other words, no asymmetry on this matter. It follows that the bar for arguing against Sober's position is much higher than previously appreciated. Opponents of Sober's position—who have so far eschewed commitments on identity metaphysics—have their work cut out for them.

I begin by introducing Sober's position in detail and then arguing that any case against it must include a theory of trans-world identity for individuals. I then consider an objection to my argument and give a reply to that objection. Finally, I ask whether there is a more charitable reading of Sober's opponents on which they might wriggle out of the seemingly onerous demands I have made of them. I believe there is such a reading, but it is one on which their position does not genuinely contradict Sober's.

2. Opening Argument. Stated carefully, the question that Sober asks is, For arbitrary adaptation a and particular individual organism O that has that adaptation, does natural selection explain why O has a rather than O having another trait (or simply lacking a)? Notice the contrastive form: does w explain why p rather than q? To this question Sober answers "no," reasoning (briefly) that any alternative scenario in which nature selects differently enough to leave O without a will be one in which O in fact never appears at all. The idea is that selection influences both which *traits* come about and also which *individuals* come about and that these two aspects of evolution's output are dependent in such a way that the emergence of a given actual individual cannot coherently be held fixed within counterfactual evolutionary scenarios in which selection is stipulated to act differently than it did in reality, building and promoting traits different from those that developed and spread in the actual history of this individual's species or population.[1] Putting the p and the q inside brackets for extra clarity, selection may well explain why $\{O$ has $a\}$ rather than $\{$a comparable but numerically different organism is present and lacks $a\}$. But selection cannot explain, says Sober, why

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1. Neander (e.g., 1988, 422) sees in Sober's reasoning the idea that selection plays a "purely negative role" within evolution, analogous to a sieve, and with no "creative" consequences. Walsh (1998, 260) disagrees: "By introducing the Creation Question and insisting that this is the crux of the debate, Neander has misrepresented the dialectic." Forber (2005) and Nanay (2005, 2010) persist with the attribution, Forber noting, however, that the Negative View is consistent with a "creative" role for selection. In any case, the current article concerns what it takes to argue for the Positive View (see below); whether this "purely negative" picture of selection's workings is correct (I agree that it isn't), and whether Sober's reasoning appeals to that picture (I don't see it) will not affect my conclusions.

{*O* has *a*} rather than {*O* lacks *a*}. The position is known as the *Negative View*.[2]

Opponents recoil from this conclusion and maintain the opposite: that selection can (and often does) explain Sober's explanandum. This alternative position is called the *Positive View* (also *Individualism*). Advocates of the Positive View argue by presenting counterexamples—schematic episodes of evolution said to illustrate natural selection explaining Sober's explanandum (Neander 1988, 1995a, 1995c; Matthen 1999; Forber 2005; Nanay 2005, 2010; Birch 2012). Nothing in the biology of these examples is unusual or controversial. Sober and subsequent advocates of the Negative View take issue only with the philosophical interpretation laid over the illustrations, that is, the claim that what is shown is a case of selection explaining why {*O* has *a*} rather than {*O* lacks *a*}. The standard Negative-View line (e.g., Sober 1995; Walsh 1998; Pust 2001; McLoone 2013) is that the alleged counterexamples are no such thing; they are instead cases of selection explaining why {*O* has *a*} rather than {some other individual lacks *a*}. This reply hinges on what counts as the same individual, and since Matthen (1999) and Pust (2001) it has generally been taken to presuppose a particular theory of individual identity called *Origin Essentialism* (details below).

My claim is that any good argument for the Positive View must also employ some rule for adjudicating sameness of the individual organism *O* between actual and counterfactual scenarios. Advocates of the Positive View must, in other words, have an (at least partial) theory of trans-world identity. I will proceed straightaway with my opening argument, which depends only on the most general considerations regarding contrastive explanation.

The contrastive nature of Sober's explanandum necessitates counterfactual thinking. Whatever else is required for *w* to explain why *p* rather than *q*, arguing for such a claim involves (at an absolute minimum) identifying some counterfactual scenario(s) in which something other than *w* obtains, leading to the occurrence of *q* (instead of what actually happened, *p*). For example, I took the subway to work today and arrived at 9:00. Had I instead chosen to walk, it would have been more like 9:30. My choice to take the subway is therefore a candidate for explaining why I arrived at 9:00 rather than 9:30. Such counterfactual thinking in turn can drag in considerations of trans-world identity. Notice that the counterfactual scenario in which I walk and arrive at 9:30 features the same individual who in actual fact arrived to work at

2. The view is sometimes presented in terms of explananda at two levels—individual vs. population, e.g., selection cannot explain why an individual giraffe has a long neck (rather than . . .), but it may explain "why the giraffe population is composed of long-necked individuals rather than of other individuals who are not long-necked" (Sober 1984, 150). This presentation is equivalent so long as the "rather than" clauses of individual-level explananda are understood to cite the same individual. If contrastive clauses are omitted, this presentation becomes misleading.

9:00 (namely, me). Here a bit of identity metaphysics is taken for granted. There is nothing at all problematic about the required metaphysics; it is utterly sensible to regard this counterfactual person as the same individual as me, and to do otherwise would only invite confusion. Nonetheless, we must acknowledge that there is a notion of trans-world identity at work, however inchoate.

Now suppose we spy an organism O in the wild bearing adaptation a. And suppose that I argue, contra Sober, that had nature selected differently in this or that particular way (over, say, the last 100 generations) then the counterfactual population emerging from this alternative evolutionary process would include organism O and that this counterfactual O would lack trait a. You might challenge me by asking why I regard the envisaged counterfactual organism as the very same individual as the actual organism about which the question was posed. To respond to that challenge, I need a theory of trans-world identity. Specifically, I need a sufficient condition for identity (or a set of jointly sufficient conditions): if actual and counterfactual organisms meet the conditions, they count as the same. Or to put it more casually, I must say what I mean by "same individual." It is important to note that I cannot avoid the issue by saying that by O I mean only some counterfactual individual or other, for in that case my conclusion is perfectly consistent with Sober's position. To go against that position—to argue for the Positive View—I must argue that selection explains why $\{O$ has $a\}$ rather than $\{O$ lacks $a\}$. And I cannot do that without recourse to some notion of trans-world identity.

I have good reason to believe that at this juncture readers will sort themselves into two camps: those who find my conclusion evident (perhaps even trivial) and those who will resist tooth and nail. Most of the remainder of the article is addressed to the latter contingent. But to the former: if my conclusion appears trivial, it is far from inconsequential. It is widely regarded as an acute liability for the Negative View that its advocates must appeal to identity metaphysics to defend their position. Advocates of the Positive View, however, do not acknowledge any need for identity assumptions of their own, much less spell out and defend those assumptions. Indeed, independence from any such metaphysical claims has even been proposed as a foundational commitment of the Positive View (Forber 2005). Moreover, the gap that (if my claim is correct) exists within arguments for the Positive View is not easy to fill. There is no appropriate theory of identity already waiting in the wings.[3] So if my conclusion is correct, then the Positive View looses its metaphysics-free appeal, and existing arguments for the view become in-

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3. Matthen (1999) argues against the Negative View in part by gesturing at an approach to identity that would seem to undermine Sober's argument for that view. One might take

valid as stated, with much difficult and unexpected work required to patch them up.

3. Objection and Reply: Burden of Proof. The main response available to those disinclined to accept my conclusion—or at least determined to resist its consequences for the debate—goes as follows. One can accept that, strictly speaking, a defense of the Positive View does ultimately depend on some understanding of individual identity, while at the same time insisting that the required metaphysics is so "low level," or banal, or otherwise unobjectionable that it need not be spelled out and defended. We ought, in other words, to give the Positive View the benefit of the doubt. After all, we all go around saying things like "If only I had trained harder, I might have finished that half-marathon," and no one demands assurances that the contemplated counterfactual person who finishes the race still counts as me. Surely, runs the objection, the same goes for "Had nature selected differently, then organism O would lack trait a."

I aim to show that this reply misjudges the extent of the required metaphysics and applies a double standard. The identity assumptions required by the Positive View are no less substantive and no less questionable than those on which the Negative View depends. Both go beyond what is presupposed by everyday same-individual counterfactuals like those mentioned above (subway to work; training harder for the race). To begin my reply, I wish to first demonstrate that even in cases when we routinely give the benefit of the doubt, there are implicit standards in play. From there we can see why those standards do not resolve the identity questions that come up when thinking counterfactually about evolution.

Consider another explanation for why I arrived to work at 9:00 rather than 9:30. Some time before boarding the subway this morning, I awoke from sleep. I might not have: I might have died during the night. Suppose I advance this explanation: that I woke up this morning explains why I arrived at 9:00 rather than a half hour later. "Really?" you respond, "Tell me more about this counterfactual scenario in which you die in your sleep and yet arrive at work at 9:30." We sit down and I show you the counterfactual closed-circuit television footage covering the entrance to my building. When the image of my colleague Charlotte appears, I say "Right there—that's me arriving at work at 9:30." Needless to say, my proposed explanation is not a good one. The only sane response is "No, that is not you; that is Charlotte." The point of the example is that even though we do not normally make a fuss about identity metaphysics when thinking about counterfactuals that feature the same individual, it is certainly not the case that anything goes.

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this as a first stab at the theory of identity that I claim the Positive View needs. See Lewens (2001) and Pust (2004) for attempts to flesh out, then criticize, Matthen's gesture.

What heuristics guide our intuitive identity assignments in everyday counterfactual thinking? It would seem that the primary considerations are simply physical and psychological continuity over time. You are the same individual as the person who signed your lease 6 months ago, and the person who appears in your Facebook photos, because of this kind of continuity. And if you think of a counterfactual scenario as one that coincides with reality up to some particular point in time, after which it begins to branch away and depart from how things in fact proceeded, then individuals mentioned in the counterfactual goings-on will trace back via this kind of continuity to join up with past actual individuals before the split with reality. This kind of continuity thinking suffices to underwrite statements like: "If only I had trained harder, I might have finished that half-marathon." The envisaged race-finishing person is, by stipulation, continuous with the actual me (of, say, 1 year ago) before I (counterfactually) took the decision to follow a different training regimen.

But if the individuals in question have clearly defined lifetimes, and if the fork in the road between actual and counterfactual occurred before any of those individuals were even present, then continuity over time will fail to connect counterfactual individuals to any actual ones. In this case, following a counterfactual individual back through time leads to a dead end: the line ends before it has a chance to join up with the actual world. Here we are thrust into the territory of thought experiments from the identity metaphysics literature, where intuitions vary and different considerations push in conflicting directions. Exactly this situation is unavoidable when it comes to counterfactuals that address Sober's contrastive clause. Consider a counterfactual evolutionary past with different selection pressures leading eventually to a population of organisms who lack trait a. Following any of those a-less organisms back through time gets us nowhere near the fork in the road between actual and counterfactual, because there will be many intervening generations during which selection did its work. Organisms emerging at the ends the actual and counterfactual evolutionary processes are, so to speak, cut off from one another continuity-wise.

Although significant adaptations will realistically require hundreds or thousands of generations of evolution, even the most idealized biological examples (e.g., Sober 1995; Matthen 1999) include at least two generations, and that is enough to block uncontroversial, continuity-based identity assignments. The top row of figure 1 illustrates the bare bones of Sober's (1995) argument for the Negative View. The left panel shows what in fact happened in some snippet of evolution. Here selection favored trait b, and organism 1 survived to (asexually) beget organism 3. Does selection explain why organism 3 has trait b rather than trait B? Had selection differed in the parental generation, reasons Sober, this might have resulted in organism 2 surviving and reproducing rather than organism 1, as shown in the right panel.
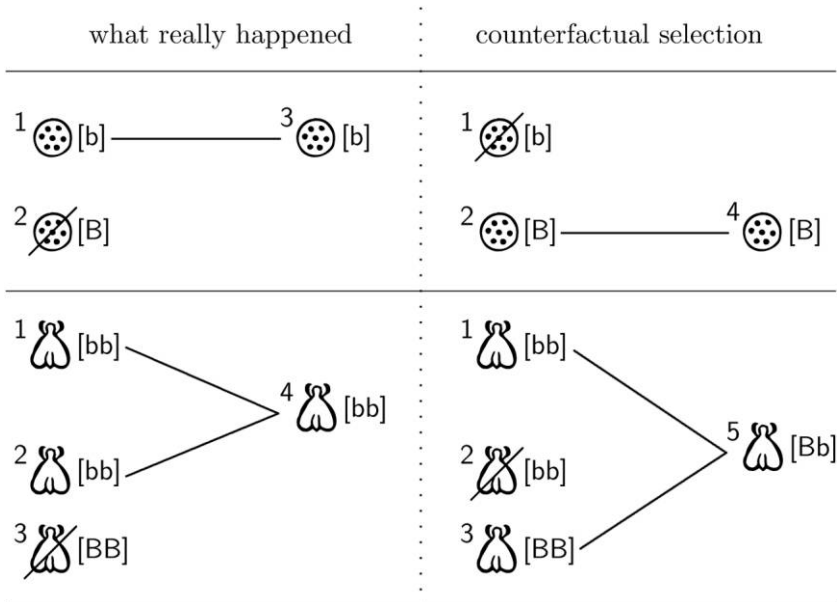
Figure 1. *Top* (asexual): 1 survives under selection favoring b and leaves offspring 3; counterfactually, selection favors B and instead 2 survives, begetting 4. Are 3 and 4 the same individual? *Bottom* (sexual): 3 expires under selection favoring bb; 1 and 2 mate and make 4; counterfactually, selection favors BB and 3 survives to mate with 1, producing 5. Are 4 and 5 the same individual?

Selection thus might explain why 3 is present rather than 4 (with b and B, respectively), but it does not explain why 3 has b rather than B. (In Sober's discussion, it goes without saying that the organisms labeled "3" and "4" are not the same individual.)

Matthen (1999) reformulates Sober's argument for the case of sexual reproducers (fig. 1, bottom row), ostensibly to arrange for the relevant actual and counterfactual organisms to have one parent in common, thereby inhibiting somewhat the automatic judgment that they are not the same individual. In the left panel selection reduces the frequency of the BB genotype, leading 1 to mate with another bb, in this case organism 2. Counterfactually, selection reduces the frequency of bb, leading 1 to mate with a BB, namely 3, as shown on the right. So selection explains why 4 is present rather than 5 (with genotypes bb and Bb, respectively). But are 4 and 5 the same individual? Matthen inquires by what right Sober presumes they are not the same. He goes on to attribute to the Negative View the following necessary condition for trans-world identity: actual and counterfactual organisms are the same individual *only if they have the same parents*. Pust (2001) comes

to the same conclusion and calls this constraint *Origin Essentialism*, citing Kripke (1980). Origin Essentialism has ever since been regarded as an implicit premise in the argument for the Negative View.

My point is that the lesson of Matthen (1999) and Pust (2001) cuts both ways. Just as supporters of the Negative View are obliged to say on what grounds organisms 4 and 5 (to follow Matthen's example) are not the same individual, supporters of the Positive View must say why they are the same. Specifically, the Positive View needs a sufficient condition for trans-world identity that is met by organisms 4 and 5 (or by their analogues in other examples). The identity considerations that come into focus in discussions of Sober's (1995) argument for the Negative View are by no means particular to that argument or (as subsequent commentators suppose) to the Negative View. The same considerations arise when arguing for the Positive View. The reason that identity metaphysics is unavoidable is exactly the same for both positions: it is because the contrastive clause of Sober's explanandum references the very same individual that in fact bears the adaptation in question. If you wish to address that explanandum, then you cannot eschew trans-world identity. And the reason that the required identity claims cannot go without saying is also the same for both views: considerations of continuity over time, which largely govern our intuitive everyday thinking about same-individual counterfactuals, do not apply to counterfactuals that span more than one generation of organisms.

4. Conclusion (**Dilemma**). For individual organism O with adaptation a, does natural selection explain why O has a rather than the very same individual having another trait? Far from answering this question, I have argued for the modest conclusion that one cannot credibly advocate either answer while at the same time refusing to say what one means by "the same individual." This conclusion is old hat for the Negative View, but it is news with regard to the Positive View: it takes more to argue for the Positive View than its advocates realize, or in any case more than they provide. One cryptic passage from Matthen (1999) notwithstanding (see n. 3), no advocate of the Positive View has proposed even a systematic way of making the identity assignments presupposed by the view, much less a rationale or justification for those assignments.[4] Advocates of the Positive View thus have their work cut out for them.

Or do they? I claim to have exposed a serious oversight in arguments for the Positive View and to have done so on the basis of what are, at least

4. Birch (2012) concedes Origin Essentialism for the sake of argument, but Origin Essentialism is a purported necessary condition for trans-world identity; it is never regarded as remotely sufficient. What the Positive View requires is a sufficient condition. (Birch's novel criterion for picking the relevant counterfactual scenario in no way reduces the need for a standard of judging whether an organism in that scenario is the same individual as the actual organism of interest.)

in retrospect, fairly obvious considerations. Have I not somehow misrepresented the Positive View? Is there not a more charitable reading of the position—one that preserves the common wisdom that only the Negative View dabbles in identity metaphysics? Indeed there is such a reading, namely, that what (at least some) advocates of the Positive View really care about is *noncontrastive* explananda of the form: why individual organism O has adaptation a. The arguments of this article apply only to Sober's contrastive explanandum. Arguing that natural selection explains why O has a need not (for all I have said) involve trans-world identity.[5] While I defer to individual authors to clarify their own positions, I do wish to note that there is considerable textual support for this reading: although advocates of the Positive View invariably address their work directly to Sober's position, in practice many of their arguments downplay the contrastive clause (Neander 1995a, 1995c; Forber 2005) or discard it altogether (Neander 1988; Nanay 2005).[6]

One corollary of this reading is that the Positive View does not contradict Sober's position after all; rather, the two address subtly different explananda.[7] From inside the framework of contrastive explanation, the question "Does selection explain why O has a?" can be answered only with "As opposed to what?" Without a contrastive clause for the Positive View's explanandum, a lack of common ground with the Negative View obscures the logical relationship between the two positions. Instead of arguing directly against Sober's conclusion, we can in this case think of advocates of the Positive View as staking out a defense—in the face of the sweeping restrictions that Sober's arguments seemed to imply—of some key explanatory roles for natural selection. In particular, advocates of the Positive View highlight the explaining that selection is routinely taken to do in our seemingly uncontroversial adaptation talk (Matthen 1999, 2002; Forber 2005) and the explaining that it must do in order for the philosophical project of teleosemantics to succeed (Millikan 1990; Neander 1995b, 1996; Nanay 2005).[8] (On the Negative View and evolutionary debunking arguments in metaethics, see Setiya [2012], 106; Mogensen [2014].)

One question, then, is whether the desired validation of natural selection as an explanans in those contexts really requires denying the Negative

5. Although see Woodward's (2003, 279–85) discussion of the importance of "same-object" counterfactuals to explanation more generally.

6. Matthen (1999) and Birch (2012) are exceptions to the rule of giving short shrift to Sober's "rather than" clause.

7. This is in line with my (Helgeson 2013) reading of Nanay's (2005) environmental limitations argument.

8. For example: "why you or I have an opposable thumb" (Neander 1995a, 586), "how all those 'exquisite adaptations' of plants and animals came about" (Neander 1995c, 59), "why you and I have eyes" (Matthen 2002, 168), "Why do cats have sharp teeth?" (Nanay 2005, 1099), and "why mental states have the content they have" (1111).

View. If the answer is "no," then there may be scope for an amicable resolution in which it turns out that everybody was right all along. In this case the wider philosophical significance of the Negative View will be somewhat diminished, but without taking away from the view's cogency in its original context: contrasting Darwinian natural selection with earlier ideas (esp. Lamarckian) about the mechanisms of biological evolution (Sober 1984, 147–55; also see Lewontin 1983).

But I do not mean to push too hard for this reinterpretation of the Positive View. I offer it only as a way out for those advocates of the view who prefer to avoid commitments regarding trans-world identity. The import of this essay can be summed up as a dilemma. Supporters of the Positive View must do one of the following things: develop and defend a theory of trans-world identity that will underwrite the identity assignments presupposed by their position (a tall order) or rethink the idea that their position contradicts Sober's Negative View.

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