

RESPONSE



Feldman *et al.* do protest too much, we think

MANAN GUPTA^{1,2}, N. G. PRASAD³, SUTIRTH DEY⁴, AMITABH JOSHI¹ and T. N. C. VIDYA^{2*} 

¹*Evolutionary Biology Laboratory, Evolutionary and Organismal Biology Unit, Jawaharlal Nehru Centre for Advanced Scientific Research, Jakkur, Bengaluru 560 064, India*

²*Animal Behaviour and Sociogenetics Laboratory, Evolutionary and Organismal Biology Unit, Jawaharlal Nehru Centre for Advanced Scientific Research, Jakkur, Bengaluru 560 064, India*

³*Department of Biological Sciences, Indian Institute of Science Education and Research Mohali, Knowledge City, Sector 81, SAS Nagar, P.O. Manauli, Mohali 140 306, India*

⁴*Population Biology Laboratory, Biology Division, Indian Institute of Science Education and Research Pune, Dr. Homi Bhabha Road, Pune 411 008, India*

*For correspondence. E-mail: tncvidya@jnca.ac.in; tncvidya@gmail.com.

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Feldman *et al.* (2017) argue that our critique (Gupta *et al.* 2017) of some of the claims made by prominent proponents of niche construction theory (NCT) is off target. Specifically, they explicitly argue that (i) NCT does not claim that NC and ecological inheritance are neglected, and (ii) NCT does not make strong claims on the basis of its formal theory. They further implicitly claim that (iii) NCT proponents have not deployed muddled logic or rhetorical devices, and finally (iv) indulge in some sermonizing on the importance of being open to ‘heresies’ in science etc. Here, we succinctly show that all four arguments are either plain wrong or internally inconsistent. Moreover, in our paper (Gupta *et al.* 2017), we had posed several specific questions to NCT proponents, none of which have been adequately addressed by Feldman *et al.* (2017). In fact, this avoidance of engaging with specific objections raised by skeptics, and the style and substance of the arguments deployed by Feldman *et al.* (2017), abundantly confirm all our original criticisms of the disappointing, post-truth manner in which some of the prominent NCT proponents disseminate and push their ideas.

First, Feldman *et al.* (2017) argue that NCT only claims that NC is neglected as a causal evolutionary process, not as a biological phenomenon, and then spend a paragraph

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berating us for not realizing this, even though we clearly made this distinction. Due to paucity of space, we will respond with just one quote: ‘...the argument that standard evolutionary theory (SET) has typically avoided incorporating a perspective wherein organisms can shape selection pressures, for themselves and for other species, by altering the environment, does not really stand in the face of the evidence, as we shall show below’ (Gupta *et al.* 2017). We followed this up in our paper with a long list of how much evolutionary research, both theoretical and empirical, has actually incorporated an NC perspective (without using the term NC) to ‘explain’ adaptive evolutionary change. Clearly, we refuted the NCT claims of neglect of NC as an evolutionary process, not just as an ecological phenomenon. Since NC was invoked as a causal explanation in so many studies without using that particular label, Feldman *et al.* (2017) try to obfuscate the issue by saying it is a fact that NC is ‘not formally listed as a cause of evolution’. We agree that it is, trivially, a fact because the label was not used even while the concept was. Incidentally, Feldman *et al.* (2017) also assert that NCT proponents do not claim that ecological inheritance was neglected. Yet, they have recently written (Laland *et al.* 2016): ‘Oxford biologist John Odling-Smee was the first to coin the term “niche construction”, the first to make the argument that niche construction should be recognized as an evolutionary process, and the first to introduce the concept of “ecological inheritance”’ (Laland *et al.* 2016). In fact, NC was recognized as a causal process in evolution

for decades before the term was coined, as was ecological inheritance. It is these terms that are new, not the concepts or an appreciation of their role in adaptive evolution.

While it is true that [Odling-Smee *et al.* \(2003\)](#) discuss various models from SET that incorporate a NC perspective, they have, nevertheless, progressively lost appreciation of the fact that the NCT models are a minor modification of existing theoretical approaches within SET and ecology, as the sequence of the following quotes exemplifies: (i) ‘it (i.e. NCT) is best regarded as an alternative means of thinking about evolutionary problems rather than as a discrete field of evolutionary enquiry’ [Laland and O’Brien \(2010\)](#), (ii) ‘NCT is more than just an alternative perspective; it is a serious body of formal evolutionary theory’ ([Laland *et al.* 2014](#)), and (iii) ‘an extensive body of formal theory explores the evolutionary consequences of niche construction and its ramifications for evolutionary biology and ecology’ ([Laland *et al.* 2016](#)). We are, nevertheless, gratified that [Feldman *et al.* \(2017\)](#) do agree with us that ‘formal models of NC deploy standard population genetic and ecological methods; thus it should be neither a surprise nor a problem that some of the findings could be anticipated given the existing literature’. Yet, it is difficult to reconcile this admission with their regular invocation of the novel outcomes possible under NC models compared to SET (e.g. [Laland *et al.* 2016](#)). One question we had asked, after our discussion of NCT models, was ‘what are the major theoretical insights emanating from this ‘extensive body of formal theory’ that are not intuitively obvious from analogous SET formulations?’ ([Gupta *et al.* 2017](#)); [Feldman *et al.* \(2017\)](#) provide no answer. To our other question, they offer an argument that what constitutes an ‘extensive body of formal theory’ is a subjective question. We do not disagree. We have already expressed our opinion on this issue, and we leave it to members of the evolutionary biology community to make up their minds on how extensive and consequential this set of modified population genetics models is. [Feldman *et al.* \(2017\)](#) also cite the prestigious journals wherein NCT models have been published; we prefer to assess the scientific contribution of papers by their contents, not their addresses.

Our criticism of the third major NCT claim, that NC is somehow an evolutionary process at par with natural selection, is actually not addressed at all by [Feldman *et al.* \(2017\)](#). Instead, their last two sections offer a rambling and somewhat confused series of arguments about how it is important in science to take ‘heretic’ ideas seriously and why they believe our paper has damaged evolutionary biology. They also suggest, in a touchingly paternalistic vein, that we should have approached them with our concerns so that they could attempt to correct our misunderstandings. Surprisingly, although they clearly do not like our assessment of their dubious rhetorical devices, they offer no rebuttal to our deconstruction of their most egregiously

dubious analogy of the murder trial. Nor do they critique our own analogy from architecture. They reference multiple studies where NC concepts have been used to understand phenomena in ecology, human biology and evolution and then use that to criticize our phrase ‘incessant repetition of “largely untenable claims”’. Once again, [Feldman *et al.* \(2017\)](#) are indulging in sleight of hand. Our very phrasing (see emphasis in quote above) makes it clear, to those who wish to see, that we are objecting to the repetition of the three types of claims by NCT proponents that we have listed—we have not objected to the use of an NC perspective at all, anywhere in our paper ([Gupta *et al.* 2017](#)). In science, we would expect that claims that an emperor has no clothes would be met with empirical evidence of the presence of fabric, not allegations of blindness on the part of the skeptics.

We completely agree that ‘heretic’ ideas should be taken seriously, but we find that [Feldman *et al.* \(2017\)](#) have completely misunderstood our paper ([Gupta *et al.* 2017](#)), when even the most cursory glance, to borrow their phrase, should have made it clear that our principal objection is not to the phenomenon of NC, nor to its role in evolution, but to the overblown claims of some NCT proponents. We object not to the heresy itself, though we may disagree with some aspects of it, but the tactics deployed to propagate it. Our stance was clearly enunciated in the abstract, the last paragraph of the introduction and the last two paragraphs of the concluding remarks ([Gupta *et al.* 2017](#)). We are also confused by the fact that despite thinking that our paper was really silly and wrong, and all our criticisms misplaced, [Feldman *et al.* \(2017\)](#) nevertheless seem to believe that our paper has damaged evolutionary biology. If our paper was really that bad, we are sure that evolutionary biologists worldwide are intelligent enough not to be swayed by our ‘silly’ arguments. Equally confusingly, alongside their arguments for not stifling ‘heretic’ work so that alternative ideas and concepts can be properly explored and tested (arguments with which we completely concur—see, e.g., [Prasad *et al.* 2015](#)), [Feldman *et al.* \(2017\)](#) actually make a plea for censorship by expressing their view that ‘Gupta *et al.*’s paper should never have been published’.

To sum up, we believe that [Feldman *et al.* \(2017\)](#) have confirmed by their response that all our criticisms about their style of academic debate were, in fact, spot on. We thank [Feldman *et al.* \(2017\)](#) for resting our case.

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References

- Feldman M. W., Odling-Smee J. and Laland K. N. 2017 Why Gupta *et al.*'s critique of niche construction is off target. *J. Genet.* [10.1007/s12041-017-0797-4](https://doi.org/10.1007/s12041-017-0797-4)
- Gupta M., Prasad N. G., Dey S., Joshi A. and Vidya T. N. C. 2017 Niche construction in evolutionary theory: the construction of an academic niche? *J. Genet.* [10.1007/s12041-017-0787-6](https://doi.org/10.1007/s12041-017-0787-6)
- Laland K. N. and O'Brien M. J. 2010 Niche construction theory and archeology. *J. Archaeol. Methods Theor.* **17**, 303–322.
- Laland K. N., Boogert N. and Evans C. 2014 Niche construction, innovation and complexity. *Environ. Innov. Soc. Transitions* **11**, 71–86.
- Laland K. N., Matthews B. and Feldman M. W. 2016 An introduction to niche construction theory. *Evol. Ecol.* **30**, 191–202.
- Odling-Smee F. J., Laland K. N. and Feldman M. W. 2003 *Niche construction: the neglected process in evolution*. Princeton University Press, Princeton, USA.
- Prasad N. G., Dey S., Joshi A. and Vidya T. N. C. 2015 Rethinking inheritance, yet again: inheritomes, contextomes and dynamic phenotypes. *J. Genet.* **94**, 367–376.

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