

Reply to Mohlenhoff et al.: Human behavioral ecology needs a rethink that niche-construction theory can provide

In their response to my recent PNAS article (1), Mohlenhoff et al. (2) embrace a view of optimal foraging theory (OFT) and its umbrella discipline, human behavioral ecology (HBE) grounded in standard evolutionary theory (SET). According to this view, anthropogenic environmental enhancements are no different from other environmental perturbations that alter selective pressures and induce adaptive behavioral responses. This perspective may explain why, as Mohlenhoff et al. (2) note, researchers working within this framework invariably ignore niche-constructing behaviors in explanations of initial domestication. Following SET, the source of environmental change is of less import than the resultant adaptive behavioral responses. These responses are framed, moreover, within a general theory of human behavior that dismisses human agency as “one of an array of historical processes or proximal mechanisms” (3) that fail to rise to the level of ultimate causes of evolution. Identifying ultimate causes of evolutionary change, following this logic, is restricted to demonstrating how “natural selection . . . shapes the way people make decisions” (4).

Rather than viewing ecosystem enhancement as nothing more than an adaptive response to environmental change, niche-construction theory (NCT) recognizes niche-altering activities as part of a complex web of reciprocal of interactions between environment and behavior that have profound evolutionary impacts (5). These activities need not be responses to external forces that adversely affect resource availability and

cause humans to undertake cost/benefit analyses of whether or not to engage in more labor-intensive, less-optimal, niche-altering behaviors. Instead, they can more profitably be viewed as initiatives humans use to actively alter selective environments and shape their own evolutionary trajectories.

NCT, moreover, expands the mechanisms of evolutionary inheritance beyond the SET focus on genes shaped by natural selection to include multiple internal and external transmission channels. In addition to epigenetic and developmental processes, these channels include acquired behaviors transmitted through social learning. In humans, the enhanced capacity for information transfer through language vastly enhances the fidelity of these inheritance channels. This capacity is the focus of cultural niche construction, a subset of NCT that explores the ways in which culture shapes the evolutionary trajectories of humans and other organisms living in anthropogenic niches (5). Thus, far from arguing for some form of human exceptionalism by emphasizing the role of human agency in evolution (3), NCT provides a framework for understanding how human cognitive capacities fall within a larger set of mechanisms by which both humans and nonhuman organisms shape selective environments and codirect their evolution. Cultural niche construction, then, provides the “general theory of behavior” that Mohlenhoff et al. (2) and others (4) claim NCT lacks.

HBE and NCT are not mutually exclusive, oppositional approaches. Indeed, the infusion

of NCT into HBE holds tremendous potential for understanding initial domestication and other transitions in human history. These benefits will not be realized if HBE continues to be viewed through the lens of SET. Instead, as advocated for HBE’s parent discipline behavioral ecology (6), there is a need for a major rethink of HBE that embraces the view of reciprocal causation and human agency integral to NCT and its macroevolutionary foundation.

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