

(Jasienski and Bazzaz 1999). Scientists tend to rely on indexes that are meant to capture the essence of the processes, but unfortunately, such indexes are very often ratios of several measurable variables. This gives us an illusion of simplicity by reducing the number of variables but makes statistical analyses less powerful and, more importantly, sweeps under the carpet the actual form of interaction between the variables comprising the ratio index. Alas, disentangling nature from nurture allows no conceptual or methodological shortcuts.

---

### Christopher W. Kuzawa

Department of Anthropology and Institute for Policy Change,  
Northwestern University, Evanston, Illinois 60208, U.S.A. (kuzawa@northwestern.edu). 4 II 14

## Why Evolutionary Biology Is Crucial for Effective Public Health Policy

Having finished Hicks and Leonard's excellent review, many readers will be convinced that newer approaches within evolutionary biology avoid the essentialism that has marred some applications of evolutionary theory within anthropology. But even if there are nonreductionistic examples of evolutionary theory to draw inspiration from, you may well ask, what do evolutionary principles really provide us in a practical sense? Is not the obvious fact of health inequality and its alignment with social constructs such as class and race proof enough that societal changes are needed? As someone who works in the area reviewed by Hicks and Leonard, I suggest that evolutionary principles are needed if we hope to inform policy, which requires going beyond observing patterns of health inequality to making a case for what causes what, specifically.

Hicks and Leonard discuss recent research showing that fetal undernutrition or stress alter multiple biological systems that negatively affect adult health and can even influence health in offspring (Benyshek, Martin, and Johnston 2001; Kuzawa and Sweet 2009). Evidence for such examples of developmental plasticity raises important questions about their underlying mechanistic basis. If their long-term health effects simply reflected damage imposed by early stress, we would not need evolutionary biology to help us advocate for effective interventions (Schell and Magnus 2007). For example, the finding that early micronutrient deficiency impairs cognitive development provides a strong rationale for policies that help ensure adequate nutrition in young children (Engle et al. 2007).

But other examples are not so straightforward. Take fat deposition—a key link between early nutrition and cardiovascular disease (CVD). Lower birth weight (LBW) individuals are more likely to develop CVD, but this is not because they become obese. In fact, they end up lighter, but they deposit fat preferentially in the visceral depot, which is innervated by sympathetic nerve fibers originating in the brain.

When the body experiences stress, these nerves secrete adrenaline in visceral fat, which releases this energy to help overcome the stressor. Not only do LBW individuals deposit more fat in this depot but also their fat cells also mobilize more fats during a stressor (Boiko et al. 2005). There is nothing about these biological changes that indicates damage. Rather, they suggest that the body learns to prioritize depositing fat in a rapidly usable depot in response to the experience of early undernutrition with downstream effects on risk for diabetes and CVD (Kuzawa 2010).

Given evidence that fetal undernutrition resets fat metabolism in LBW individuals, one might reasonably expect that supplementing the diet of pregnant women would lead to higher birth weights and lower CVD risk. Contrary to this hope, pregnancy nutritional interventions often have negligible effects on offspring birth weight (Kramer and Kakuma 2003). We are thus faced with a paradox and also a policy dilemma: LBW—indicating reduced fetal nutrition—predicts future health, but supplementing women's diets during pregnancy seems not to appreciably change birth weight. What might account for this apparent disconnect between what the mother consumes and the nutrients that the fetus receives?

Evolutionary theory and the principles of human adaptability give us clues. It would not make sense for the fetus of a long-lived species to set metabolic priorities for life based on ecological conditions during a few months of gestation, which are subject to the vagaries of seasonal and other short-term variability. Instead, the quantity of nutrients that the mother's body transfers to the fetus is buffered against such short-term variability, but it is correlated with, and thus communicates information about, her average nutritional experiences as embodied biologically through her lifetime of experiences (Kuzawa 2005). Considering this longer timescale of adaptation potentially helps explain why traditional pregnancy supplementations often yield so little: if the mother's body filters out short-term "noise" to help the fetus track stable ecological trends, fetal development will ignore unreliable detours of the sort that dietary supplements represent. An evolutionary perspective thus points to the need for an intergenerational and sustained approach to interventions: improving the developmental nutrition of future mothers should help send the signal of long-term nutritional change, elevating offspring birth weights and reversing future adult health disparities (Kuzawa and Thayer 2011).

If the long-term health effects of early environments simply reflected damage, evolutionary biology would buy us little. But some examples of developmental plasticity are more complex than simple vulnerability, and we need evolutionary principles to help make sense of them. If the nutrients transferred to the fetus do indeed communicate information about the past, designing effective interventions will require understanding the nature of these cues and what they respond to during the mother's (and grandparents'; Pembrey 2010) development. The recent developments discussed by Hicks and Leonard not only make evolutionary biology less threatening to

anthropology—embracing them will allow our field to inform more effective policy changes aimed at alleviating health inequality.

---

**Robin G. Nelson**

Department of Anthropology, Skidmore College, 815 North Broadway, Saratoga Springs, New York 12866, U.S.A.  
(rnelson1@skidmore.edu). 3 II 14

In this piece, Hicks and Leonard envision a theoretical bridge between political economic models current in critical medical anthropology and adaptationist paradigms and hypotheses testing employed in biological anthropology. Although several scholars (duly cited) have headed this call, an exact articulation of a theoretical framework has yet to have been formulated in biological anthropology. This paper serves as a meaningful step toward constructing an approach that accounts for political economies in biological processes.

The authors dutifully work through current evolutionary inheritance models and articulate the ways that these theories already allow for possible influences of cultural practice within biological research. However, there is a subtext that is only hinted at throughout the piece. The resistance to cultural theory in biological anthropology and hypotheses testing in cultural and medical anthropology reflects divergent perspectives on what qualifies as methodological rigor. In some circles, the continued presumption that adaptation models are reductionist is rooted in disciplinary histories that were indeed quite problematic. Early studies explored the *naturalness* of people of color and described biological adaptations and compensations devoid of historical and social context. However, as Hicks and Leonard note throughout this article, a significant number of biological anthropologists transcend this historical disciplinary legacy, challenging the assumption that adaptationist paradigms are inherently progressive, linear, or natural (see in-text references to collected works by Gravlee, Dressler, and Sweet for examples). Within cultural anthropology, specifically critical medical anthropology, there has been significant resistance to engaging with studies that both include hypotheses testing and utilize cultural theory. In my own discussions and interactions on the boundaries of biocultural anthropology, I have observed that much of the resistance from medical anthropology to the hypotheses testing and adaptationist paradigms present in biological anthropology stems from methodological differences in the presentation of people's stories and analyses of how their social lives are inherent part of their biologies.

Although few reference it directly, Geertz's (1973) call for thick description has been heeded by cultural anthropologists, and at least a muted intonation of self-reflexivity permeates most publications within the discipline. This methodological focus on extensive detail and self-reflection does not easily fit within biological anthropology's subdisciplinary parameters

of exposition in article form. These articles often feature a relatively rigid organizational schema that is utilized across scientific disciplines and features brevity in explanation, quantitative data analyses, and larger sample sizes. These differences in the presentation of data and research foci have been interpreted as a failure by biological anthropologists in understanding and properly contextualizing the lives of their study participants. Many biological anthropologists work within one research community for years, returning for multiple field seasons and publishing several papers about these communities. These papers can and should be viewed as parts of a series composing a larger body of work exploring the lives of their study participants rather than as single minimalist and reductionist examinations. For reference, see work by Mark Flinn and colleagues on the island of Dominica and the articles by various researchers (including the authors) using the Tsimane Amazonian Panel Survey (Brabec et al. 2007; Flinn 1986, 2009; Flinn and England 1997; Godoy et al. 2008, 2009; Nyberg 2012a; Nyberg et al. 2012; Quinlan, Quinlan, and Flinn 2005; Reyes-Garcia et al. 2010; Tanner et al. 2009, 2013). This straw-man critique of hypotheses testing and explorations of health outcomes as being inherently devoid of cultural context reflects a failure to engage with current literature in the subdiscipline.

The theoretical bridge that Hicks and Leonard argue for in this piece overtly challenges the very situatedness of culture in our discussions within anthropology. Is culture a "means of adaptation," as suggested by Little (2010) and referenced in this piece? Or is culture something completely different? For many biological and cultural anthropologists, the well-worn axiom that humans are inherently biological and cultural beings is simply a talking piece. Much of the resistance toward a true bridge between political economic models and hypothesis testing lies in whether researchers find it appropriate to study biological health outcomes (using Western medical models and methods) or whether they are willing to allow their models to be muddied by the social and political shifts in their study communities. The authors have provided us with not only plentiful examples of the rewards of a truly synthetic biocultural perspective but have also framed varied theoretical approaches as to highlight their shared applicability to studies of contemporary human populations.

---

**Ivy L. Pike**

School of Anthropology, University of Arizona, 1009 E. South Campus Drive, P.O. Box 210030, Tucson, Arizona 85721, U.S.A.  
(ilpike@email.arizona.edu). 28 II 14

In a recent New York Times op-ed, Nicholas Christakis (2013), a physician and sociologist at Yale University, provocatively suggested that the social sciences inspire a lack of confidence by not embracing new frontiers, saying "Everyone knows that . . . people are racially biased and that illness is