Review

Kevin Laland, *Darwin's Unfinished Symphony: How Culture Made the Human Mind* (Princeton, NJ and Woodstock, NY: Princeton University Press, 2017), 464 pp. ISBN: 978-0-69115-118-2. \$35.00/£27.95 hbk.

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I do not hesitate to credit Laland's latest book as one of the most well-written and wide-ranging examples of gene-culture co-evolution. Other exponents of this line of thinking like Robert Boyd and Peter Richerson, F. John Odling-Smee, Kevin Laland and Marcus W. Feldman, Dereck Bickerton, Joseph Henrich, as well as Peter Turchin, have also contributed with excellent and seminal books. Laland however, has succeeded in writing a persuasively comprehensive account that not only brings forward exciting and thought-provoking new theses but is also accessible to a wider public.

The book comprises 12 chapters divided into two parts. The first part focuses on the foundations of culture, thus paving the way for the second part that takes up the question of the evolution of the mind. The book concludes with a brief epilogue. It is rich in endnotes and has a comprehensive index of names and subjects. Chapter 1 – sharing its title with the book itself – takes its point of departure in the final and illustrious passage of *On the Origin of Species*. Darwin saw how the production of higher animals follows directly from the war of nature, and from famine and death, and he was keen on accentuating how such a view of life is one of grandeur. Laland justifiably takes Darwin a step further: “The tremendous legacy of Darwin is that so much of that interwoven majesty can now be explained through the process of evolution by natural selection” (p. 1).

There is, however, more to this argument. When Theodosius Dobzhansky contended that “Nothing in Biology Makes Sense Except in Light of Evolution”, he understood biology in contrast to culture (Dobzhansky 1973). Laland pushes the argument further by assuming that nothing in culture makes sense except in light of evolution. Many humanities scholars are likely to oppose such an understanding by emphasizing the autonomy of the culture, but they should take pause. Laland does not turn “culture” into biology. The book is a grand testimony to the fact that “Biology provides

no substitute for a comprehensive historical analysis. However, our understanding of the underlying biology feeds back to make the historical analysis so much richer and intelligible” (p. 314). In fact, the principal argument of the book is that as modern *Homo sapiens* we now live in an era in which “culture” exerts decisive influence on our “biology”. According to Laland hominin evolution in effect may be divided into three phases: 1) A stage from at least 3.6 billion years back to the beginnings of life in which the gene-side of the culture-gene co-evolution was determinative; 2) a period from sometime between 4 to 2 million years ago to the appearance of early agriculture approx. 10,000 years ago characteristic of equal determinacy in the culture-gene constellation; 3) and an epoch from 10,000 years ago to the present with the escalating influence of the culture-side in co-evolution (p. 318, cf. p. 234).

In addition to the emphasis placed on the culture-gene co-evolution theory, Laland has another axe to grind. Contrary to much contemporary literature produced by primatologists like Frans de Waal and Nathan Lents, who accentuate the closeness between humans and apes, Laland gives prominence to the distinctiveness of the hominin lineage. Yes, apes as well as other species have culture, but they do not possess cumulative culture (cf. p. 29, p. 150). This is a major and cardinal point of the book. Even more so, Laland draws attention to the fact that the proximity in terms of genes between *Homo sapiens* and bonobos and chimpanzees has often been misunderstood by scholars who took it to signal a closer resemblance than is warranted if one understands what genes are (pp. 16–19).

Chapter 2 takes up the question of the ubiquity of imitation and dwells on a crucial problem: Roger’s paradox which against common thinking implies that culture inevitably enhances biological fitness. “Asocial” learning through one’s own efforts is costly, but it assures accurate, reliable, and up-to-date information. “Social” learning by copying others, on the contrary, is easily obtainable and does not involve much investment of the individual. However, it involves the risk of reproducing mistakes. Therefore, as Chapter 3 on the reason for copying makes clear, and according to mathematical models, any population will reach an equilibrium at which the payoff to “asocial” and “social” learning strategies will be equal (p. 55). Laland demonstrates how imitation only works under special conditions characterized by the general rule that copying proves beneficial only when done efficiently.

The argument is explored further in Chapter 4 in which Laland, on the basis of the difference between two fishes, the three-spined stickleback (*Gasterosteus aculeatus*) and the ninespine stickleback (*Pungitius pungitius*), shows how animals’ possession of specific social learning competences are

adapted through natural selection to tackle particular challenges arising from their environment. The crucial point is that evolutionarily strategic but certainly not blind copying pays off (p. 98). This can account for what happened in the primate lineage eventually leading to the hominin line. This idea is elaborated in the next two chapters focused on the roots of creativity and the evolution of intelligence, which paves the way for the cardinal argument that social learning takes a distinct form in the hominin lineage: faithful fidelity in conjunction with language.

How did the evolution of intelligence come to pass? If it was not imitation *per se* that was adaptive, but efficient copying, how did it occur? Undoubtedly, big brains are “not a prerequisite for social learning, but they may well support more efficient, higher-fidelity forms of social learning, thereby allowing copying over greater distances, high-precision imitation, cross-modal integration of perceptual and motor information, the computational power to implement sophisticated social learning strategies, and more” (p. 147). A key point and something with a distinctive twist in current research, although prefigured by Michael Tomasello and Joseph Henrich, is the emphasis on high-fidelity transmission as crucial for the hominin success (cf. Tomasello 2009; Henrich 2016). High-fidelity by means of active teaching, language and the use of exogamic memory storage favours ratcheting and cumulative culture (cf. also Bickerton 2009). So, ultimately, accounting for hominin success implies a theory of teaching conducive to various elements underscored by other scholars in the field as decisive for the emergence of cumulative culture (e.g. Henrich’s learning and Turchin’s cooperation; see Turchin 2015). The distinctive emphasis Laland places on high-fidelity and his careful differentiations between copying, asocial and social teaching are definitely new and important.

Chapter 8 elaborates on the importance of language in conjunction with high-fidelity transmission. Language did not bring about cumulative culture, but it was constitutive for the extension of high-fidelity transmission to increasingly new areas (cf. Bickerton 2009, on which Laland also builds but without turning scavenging into the crucial drive for protolanguage and high-fidelity teaching). In fact, language may be seen as an adaptation functioning “to increase the accuracy, reduce the costs, and increase the scope of teaching” (p. 192). Teaching in the form of “actively setting out to educate another individual” (p. 5, cf. p. 157) is the crucial driver in hominin evolution. Interesting and novel in this regard is Laland’s argument for the existence of protolanguage and a capacity for teaching as early as 1.7 million years ago based on the emergence of Acheulian culture. Most scholars in the field date the emergence of symbolic culture to around 45,000 years ago, but Laland persuasively pushes it another 1.25 million years back in time.

Chapter 9 presents the core argument of gene-culture co-evolution in detail. In line with the essential argument, Laland argues that high-fidelity transmission not only favours gene-culture co-evolution but also promotes and supports cumulative culture. The examples are abundant and expressive: handedness, sexual selection and lactose tolerance. Chapter 10 on the dawn of civilization demonstrates *in concreto* how cumulative culture ratcheted off with the appearance of early agriculture. Simultaneously, this transition was conducive to an immense increase in population and overload in information – something patently witnessed by the internet and megalopoleis of the present world. Surely, this called for new forms of cooperation, which is examined in Chapter 11. Here Laland points to the importance of norm systems with concomitant reward and sanctioning practices as stabilizing measures for upholding and securing cooperation. Again, teaching proves decisive, since teaching instills norms as something to abide by and strive towards the fulfillment of.

The last chapter on arts explores new territory by applying evolutionary theory to the arts. In this respect, imitation also is crucial, but, in my opinion, Chapter 12 is a little too talkative and void of the lucid argumentative prose of the previous chapters. Surely evolution can and should be applied to the arts as is also implied in the catchphrase that epitomizes the work of Robert N. Bellah and Merlin Donald, i.e. that “nothing is ever lost” (cf. Bellah 2011). From a Peircian perspective, it makes perfect sense to think of the infinite processes of *sēmiōsis* in terms of evolution (cf. Charles Sanders Peirce’s notion of habit), but certainly there is more to explore here than what one finds in Laland’s provisional ruminations.

As may be seen from my eulogy, I am full of praise of Laland’s book; but is there really nothing to criticise? I am much taken by the argument. Laland writes elegantly, convincingly and with admirable acuity. However, as regards the question of culture in the gene-culture co-evolution in the more recent hominin lineage, it would have been interesting had Laland spelled out the different selection mechanisms at play. While natural selection remains the main engine of evolution as such, other equally important mechanisms (both selective and non-selective) might be included to fully account for intentional agents who, by virtue of the enhanced accumulation, persistence, and transmission of cultural traits, have become capable of exerting deliberate influence on their “biology”. I grant that this is not the main focus of the book, but such aspects are indispensable to acquire a more comprehensive understanding of *Homo sapiens’* predominant reliance upon culture and its potentially even more incremental role in hominin evolution.

References

- Bellah, R. N. 2011. *Religion in Human Evolution: From the Paleolithic to the Axial Age*. Cambridge, MA and London: The Belknap Press of Harvard University Press. <https://doi.org/10.4159/harvard.9780674063099>
- Bickerton, D. 2009. *Adam's Tongue. How Humans Made Language, How Language Made Humans*. New York: Hill and Wang.
- Dobzhansky, T. 1973. "Nothing in Biology Makes Sense Except in the Light of Evolution". *The American Biology Teacher* 35(3): 125–29. <https://doi.org/10.2307/4444260>
- Henrich, J. 2016. *The Secret of Our Success: How Culture Is Driving Human Evolution, Domesticating Our Species, and Making Us Smarter*. Princeton, NJ and Woodstock: Princeton University Press.
- Tomasello, M. 2009. *Why We Cooperate. Based on the 2008 Tanner Lectures on Human Values at Stanford*. Cambridge, MA and London: A Boston Review Book/The MIT Press.
- Turchin, P. 2015. *Ultrasociety: How 10,000 Years of War Made Humans the Greatest Cooperators on Earth*. Beresta Books, <http://peterchurchin.com/ultrasociety/>