

The Nature of Culture: Based on an Interdisciplinary Symposium 'The Nature of Culture,' Tübingen, Germany

Miriam N. Haidle, Nicholas J. Conard, and Michale Bolus (eds.)

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Reviewed by SUSAN CACHEL

Department of Anthropology, 131 George Street, Rutgers University, New Brunswick, NJ 08901-1414, USA; Cachel@rci.rutgers.edu

This book is the result of an interdisciplinary symposium held in 2011 to explore the role that culture played in early human expansions. The symposium had two goals: first, to develop a unified theory of cultural evolution from data collected from great apes, sea mammals, and birds; and, second, to examine the nature of culture as defined by the social sciences and humanities. The evolution of cultural behavior is ultimately presented in terms of information flow, using individual ontogeny, archaeology, and ethology. The results are presented in twelve chapters, written almost exclusively by scholars from Europe, Israel, South Africa, and Australia.

The editors summarize the major points in each chapter in an introduction that also presents the symposium's contentious debate and final model of cultural evolution and intensification in cultural capacities—the EECC model. It is irritating that this acronym is nowhere explicitly defined in the book. It stands for the Evolution and Expansion of Cultural Capacities, and is further explicated in Haidle et al. (2015). The model is illustrated in Figure 1.2. Eight grades of cultural evolution are spread across two dimensions—a dimension of evolutionary biology and a dimension of history and sociality. The four lower grades (social information, social learning, traditions, and basic cultural) exist in some animal species, and are documented by ethological data. The four higher grades (modular, composite, complementary [solving a problem with a new concept], and notional [dealing with abstract concepts]) exist in hominins, and are documented by archaeological data. The scheme is not hierarchical, because the grades can exist simultaneously, and do not inevitably replace each other, as they did in nineteenth century schemes of human cultural evolution, such as that of Lewis Henry Morgan, for example (Morgan 1877). In addition, the model is meant to account for disjunction between actual behavior displayed (performance) and potential capacity for that behavior.

Haidle's chapter discusses Tasmanian culture in the late eighteenth century, which, in the early twentieth century, was compared to that of Mousterian people, and, in the late twentieth century, was compared to that of common chimpanzees. It is estimated that less than 10,000 Tasmanians existed at the time of European contact. These people were organized into 9 endogamous tribes, separated into 48–80 local bands of about 30–50 people each. There were 12 languages, divided into 5 distinct clusters. Material culture was the most primitive recorded by ethnographic

evidence. Archaeology apparently documents that major cultural elements (the eating of marine fish, bone points, and the ability to make fire) had been lost, although Haidle observes that the loss of fire-making is based on sparse evidence, and that the ability to transport fire would have been very practical in the rainy Tasmanian climate, which would make starting fire very difficult. Haidle uses the distance between identification of a problem and its solution (the "problem-solution distance") of Wolfgang Köhler that was developed in the early twentieth century as the protocol for examining cultural complexity. Köhler used this protocol to study the mentality of apes. Haidle offers no practical scheme for translating archaeological data into different stages of the problem-solution distance. Köhler's chimpanzee investigations unfortunately taint Haidle's later critique of the use of wild common chimpanzees to examine Tasmanian culture. Haidle extensively analyzes William McGrew's comparison of Tasmanian behavior to that of wild common chimpanzees. She comments that McGrew deals only with food procurement behavior. Even so, she notes that McGrew left out Tasmanian stone knives and eight additional items. She further describes how stone tool assemblages increased in complexity and incorporated exotic lithic raw materials, even though fish-eating and fire-making were lost. Haidle concludes that the Tasmanians did not suffer from deteriorating mental abilities, even if their material culture became less complex.

Gerhardt's chapter is a philosophical discussion of why culture is not distinct from nature. He considers technology to be the vital element that organizes nature into culture. Whiten discusses the pre-hominin foundation of human culture by focusing on the great apes, particularly common chimpanzees. Whiten wrongly claims (p. 33) that common chimpanzees make and use a greater variety of tools than any other non-human animal. Capuchin monkeys and corvid birds rival, if not trump, chimpanzees. Although Whiten recognizes that social learning and traditions are widely distributed in the animal world, he argues that a basal great ape capacity for culture existed at 16–14 mya. The relative paucity of traditions in gorillas and bonobos must then be explained. The emphasis on common chimpanzees ignores the fact that Japanese primatologists have accumulated over sixty years of evidence for multiple innovations and traditions among Japanese macaques. And New World tufted capuchins naturally exhibit the greatest evidence of tool use among living non-human primates. Because com-

mon chimpanzees show percussive tool behavior, Whiten believes this is a pre-adaptation to stone tool knapping in early hominins. Nevertheless, tufted capuchins engage in impressive amounts of percussive and power tool use, which illustrates the independent origins of animal tool behavior. Humans maintain culture by teaching, sharing, and faithful imitation, and Whiten tries to make the case that chimpanzees show some degree of imitation, but this is dubious. Because wild chimpanzees lose 50 percent of shared cultural traits over a distance of 700 kms, Whiten suggests that contemporary Oldowan sites might exhibit a similar loss of traits over this distance.

Alperson-Afil and Goren-Inbar examine the rare limestone artifacts at the 790,000-year-old Israeli site of Gesher Benot Ya'akov. These artifacts occur in 15 horizons, spread over 50,000 years. Because the limestone reduction sequences remain the same over this 50,000 year span, the authors conclude that only higher cognitive functions and faithful cultural transmission could generate such conservatism. Wadley infers complex cognition and culture from technological changes and the occurrence of symbolism, beginning 100,000 years ago.

Uthmeier examines Neanderthal group identity using bifaces dating from 60,000–35,000 years ago in the Mousterian of Acheulean Tradition and the Micoquian. Although he concedes that stone tools are minor signifiers of group identity, in comparison to traits that are invisible to archaeology, such as language and bodily ornamentation, he argues that biface reduction is complex and standardized enough to serve as a social marker. Uthmeier concludes that Micoquian bifaces indicate the existence of two extended social networks in Europe during this time range. Bolus, in contrast, argues that stone, wood, and bone tools of the European Early Upper Paleolithic are poor indicators of group identity. Although they are the most commonly found objects in the archaeological record, they have a weak register of “style,” which is a robust sign of social identity. A physical anthropologist can recognize the parallel with using biological traits to indicate phylogenetic relationships. If musculo-skeletal, dental, or nervous system anatomy is too simple, it is impossible to discern whether similarity reflects common ancestry or convergent evolution.

Nowell first marshals evidence for brain synapse growth, plateauing, and pruning in the prefrontal cortex of modern humans that continues from infancy into adolescence. Childhood and adolescence are associated with play behavior in all mammals. Experiments with laboratory mice show that neural anatomy is changed by play deprivation, which underlines the necessity of play for normal behavioral development. Nowell then argues that, because Neanderthals mature slightly more rapidly than modern humans do, they experienced less childhood play than modern humans. She connects childhood play with behavioral innovations, and associates fantasy play, in particular, with abstract representations and novel problem solving. Because the shorter childhoods of Neanderthals meant less play, and presumably less fantasy play, this

explains the absence of representational art and symbolic behavior in Neanderthals, as seen in the fantastic composite lion/human carving from Hohlenstein-Stadel. I question whether the slight difference in maturation rates between Neanderthals and modern humans are enough to signal a major change in higher cognitive functions. I would further argue that Neanderthal burial practices signal the presence of minds capable of symbolic behavior. And the archaeological record continues to surprise us with evidence of complex Neanderthal behavior, as witnessed by the 176,000-year-old intricate stalagmite circles with traces of fire underground at Bruniquel Cave in southwestern France (Jaubert et al. 2016).

In a long chapter, Davidson cogently argues against the EECC model advocated by the editors of this volume and most of the other authors. He first lays out the evidence for the widespread existence of culture based on social learning in the animal world, as long as species are social and well-studied. “But since social learning can be found among animals which do not share a common ancestry only with other ‘culture bearing organisms’, there are, at the same time, probably many convergent elements of any case of social learning, making it difficult to unravel what is relevant about comparison with chimpanzees, and what is not. In other words, the cultural behavior of early hominins contains some elements that are plesiomorphic [primitive] and others that are homoplastic [convergent] with other instances of cultural behavior.” (p. 105). This is why Davidson is against the EECC model, which assumes that living common chimpanzees are representative of the behavior of hominin ancestors. The EECC model also implies cultural progress, although natural selection holds no promise of progress. The EECC model further neglects the analysis of behavioral variation that conferred survival on some hominins and extinction on others. Davidson examines in detail the archaeological sequence from Oldowan, Acheulean, Levalloisian, Mousterian, and Upper Paleolithic. The Oldowan demonstrates that early hominins could not only pound and probe like common chimpanzees, but could also cut with stone flakes—a behavior not seen among non-human animals. But Oldowan artifacts are found outside the Early Pleistocene of Africa, and may represent not a particular culture, but a default state that occurs whenever stone flakes are produced by simple knapping (p. 110). Davidson argues that the Acheulean, Levallois, and Mousterian also show independent origins by demonstrating, for example, that handaxes were probably invented at least five times. In short, Davidson concludes that stone tool typologies become reified into cultural entities, and that the usual studies of stone artifacts do not yield good insights into the social learning of fossil hominins.

Tennie et al. propose a thought experiment—the Island Test for Paleolithic culture. Could an early hominin completely isolated from an early age on an island invent and produce Oldowan and Acheulean artifacts by himself? They argue that a species has a Zone of Latent Solutions (ZLS). These are behaviors that do not require high-fidelity transmission, unlike cumulative culture, which requires

teaching and imitation. At the end of the thought experiment, they conclude that the default approach to the Oldowan and Acheulean is to assume no teaching or imitation existed. One might argue that the production and use of stone flakes for cutting involves some degree of teaching and imitation, given how difficult it is for novice modern human knappers to produce usable flakes, and given the complex sequence of neurological activity that occurs in the human brain as knapping occurs. Yet, Tennie et al. posit that cumulative culture arises very late in time, perhaps only hundreds, or tens of thousands of years ago. In the final chapter, Lombard studies Paleolithic hunting weapons as signifiers of human behavioral flexibility. She notes that the problem-solution distance increases from wooden spears to hafted spears to bow-and-arrow technology, which is based on the mechanical projection of a weapon. She discusses at length the difference between ratcheting versus mountaineering in the origins of cumulative culture. She believes that the ratcheting analogy is too rigid, and implies a unilinear trajectory. The mountaineering analogy is more appropriate, because it implies that technologies can be lost, systems can fail, and alternative routes can be taken—in much the same way that mountain climbers can fall, lose equipment, and try different approaches to reach a summit.

The editors of this volume present a mix of both primatological and archaeological discussion on cultural origins to answer the question of when and why hominins became dependent on technology. The primatological papers are very much fixated on common chimpanzees, but authors throughout the book recognize how widespread

the evidence for culture is among mammals and birds. The archaeological papers range from the earliest Paleolithic to the Early Upper Paleolithic. The volume contains many beautiful and informative photos and other illustrations, and the book is also available in electronic format. The editors are not afraid to indicate that argument and controversy took place during the symposium before their chosen EECC model was produced. And they are not afraid to include a major chapter by Davidson that critiques their selected model. I agree with Davidson that there can be no unified model of cultural evolution, because culture arises independently many times in the animal world, and probably independently among hominins.

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