
Between Kin Selection and Cultural Relativism: Cultural Evolution and the Origin of Inequality

William T. Lynch

Wayne State University

Cultural anthropologists and sociobiologists developed initially incommensurable approaches to explaining cooperation and altruism in human societies. When understood as complex cultural adaptations, however, scientific research programs are subject to piecemeal changes in the research programs driving scientific research. The emergence of new research programs in cultural evolution and group selection resulted. This transformation is examined with a focus on explanations for the origin and maintenance of human inequality. The transmission, modification, and selection of the complex cultural packages underlying egalitarianism and hereditary inequality challenge both the focus on biological roots of hierarchy and the autonomous construction of cultures.

1. Introduction

One way to interpret the significance of the “Kuhnian revolution” in the history and philosophy of science is as implying that successful scientific theories are complex cultural adaptations. Like the complex cultural practices studied by anthropologists in traditional societies, scientific paradigms are the result of cultural evolution and come as a package that functions well for guiding the practice of a scientific community, but that cannot be taken apart into discrete truth claims that are tested directly against nature. A complex cultural adaptation involves both the invention of a new technique or practice that is transmitted with high fidelity by cultural means and its modification and augmentation to fit the demands of new circumstances (Tomasello 1999, p. 5; Boyd, Richerson, and Henrich 2013, pp. 132–3; Henrich 2016, pp. 56–7).

I am grateful for helpful comments on earlier drafts from José Cuello and anonymous referees.

Where Kuhn erred was in seeing scientific paradigms as monolithic when it is clear that science is characterized by multiple, competing research programs that shape inquiry in different ways. Lakatos understood a research program to be a succession of theories developed on the basis of conventionally accepted “hard core” assumptions and positive heuristics designed to translate the hard core into concrete theories (Lakatos 1970). In this paper, I develop this idea that distinct, competing research programs exist in mature science and are compared largely in terms of their fruitfulness in generating further productive scientific work.

As such, research programs are evaluated by their trajectories over time and cannot be broken down into static correspondences with nature. A focus on research programs is different from a focus on paradigms because the emphasis is on a succession of theories, which can show progress or regression in generating novel predictions and corroborations. Such a criterion of progress substitutes internally generated growth for a criterion of correspondence (or falsification thereof) connecting a theory to the world directly (Hacking 1981).¹

Research programs function to drive new scientific work by training scientists in distinct schools with different metaphysical and methodological assumptions, the technical core of scientific work combining Lakatos’ hard core and positive heuristics for translating those assumptions into concrete scientific work. Since the technical core of scientific research programs incorporate metaphysical assumptions about how the world is and behaves, research programs may encode political assumptions as a matter of course, particularly when the research program looks to explain human behavior.

Recent work on Lakatos’ philosophy of science shows that his approach was shaped by his engagement with dialectical Marxism in his native Hungary, linking the social determination of scientific knowledge to a changing engagement with the natural world that saw progress as the dialectical succession of theories over time rather than a logical correspondence between theories and the world (Hacking 1981; Kadvany 2001; Dusek 2015; Lynch 2018). Research programs advance and recede based

1. Thus, an evolutionary epistemology based on competing research programs differs from one that identifies falsification as the mechanism corresponding to natural selection (Popper 1972), since there is no guarantee that research programs that function well to replicate themselves correspond to the world or possess greater verisimilitude. See also Hull (1988, p. 436) on “conceptual fitness,” albeit understood in terms of “kin selection” via intellectual lineages. In this sense, Lakatos’ account of the growth of knowledge, rather than its correspondence with an external reality, fits with a conception of differential survival and reproduction of research programs over time based on their capacity to be fruitful in attracting adherents and generating new scientific work.

upon their changing ability to produce new knowledge employing the technical core of the research programs.

In further developing a dialectical approach, Paul Feyerabend argued that theories that were incommensurable, because they could not be compared for their empirical success via a common measure, could nonetheless be used as an external tool of criticism and hybridized over time (Feyerabend 1976, 1978, 1987). Lakatos' research programs could not be considered permanently separate lineages. Both Lakatos and Feyerabend's philosophies of science can be seen to work out specific models of the cultural evolution of science, a point I will return to at the end (Lynch 2017).

What Feyerabend added to Lakatos' philosophy of science was the identification of incommensurable perspectives that could isolate different programs for a time, providing for what he called breathing space, before allowing that later developments could involve hybridization and integration of formerly incommensurable perspectives. Incommensurable theories incorporate different theory-laden observational languages that make logical comparisons impossible. However, the introduction of a new theory incommensurable with the older theory can advance science by providing for a fundamentally new ontology (Oberheim 2005). Feyerabend's theory of incommensurability differs from that of Kuhn in suggesting temporary suppression of competition via a principle of tenacity, while allowing theories to be hybridized from formerly separated research programs (Feyerabend 1970, 1978, 1987).

A good example of separate research programs giving way to hybridity and a new basis for research can be seen in the conflict between 1970s-era sociobiology and cultural anthropology, transforming partially and incompletely in recent decades to hybrid perspectives on group selection and cultural evolution. The 1970s war between biologically reductionist and cultural relativist approaches involved complete, reinforcing packages of technical and political assumptions related to classifying and explaining the world and political or metaphysical assumptions about human nature, social hierarchy, and cultural flexibility. As opposite poles, biological reductionism in sociobiology sought to replace the social sciences with a biological account of human behavior, while cultural relativism argued that human cultures were autonomous constructions with distinct rules unconstrained by biology.

Only with the revival of group selectionist arguments by David Sloan Wilson and Elliott Sober, the critique of "adaptationist" approaches to biology by a "Marxist" school of evolutionary biologists led by Richard Lewontin and Stephen Jay Gould, and the development of an approach to cultural evolution that identified a distinct inheritance system for humans by Boyd and Richerson, could these incommensurable approaches

give way to a new basis for scientific research that took a middle path between biological reductionism of culture and the autonomy of culture associated with cultural relativism.² The emergence of this new approach not only represented a middle way between biological reductionism and cultural relativism, it was facilitated by a) the development and modification of the technical core ideas themselves, and b) the movement of scholars across distinct social worlds and the formation of hybrid communities.

In contrast to approaches that separate out alleged scientific from political elements, alternatively identifying sociobiology with a politically motivated corruption of knowledge or its critique with inappropriate Marxist or relativist intrusion upon solid biological knowledge, I argue that distinct research programs come as packages that combine technical methods designed to guide research and political ways of organizing scientific inquiry and its use.³ Research programs come together in ways that function to define acceptable technical work and appropriately bounded scientific communities at once. They do not remain this way as internal developments and relationships between scientific (and extra-scientific) groups change over time, altering the underlying definitions of acceptable scientific work and workers. I turn now to identifying key technical assumptions, the ways these assumptions were articulated over time, and the political resonance of these developments for the public debate they spurred.

2. Group selection provides just as much of a biological basis for human behavior as individual selection, since the differential survival of groups affects the survival of genetic traits dominant in those groups, such as altruistic behaviors that would be selected against by individual selection. In application to human evolution, group selection theorists emphasize intragroup cooperation over competition, leading to distinct cultural practices carried out by different groups. When these groups compete, those with cultural practices better facilitating group survival transmit their cultures, which can be treated in terms borrowed from population genetics' treatment of individual selection and adaptation, if internal competition is suppressed (Boyd and Richerson 1985; Gardner and Grafen 2009). In short, group selection can affect both genetic transmission and cultural transmission in humans. Thus, many group selection theorists speak of "cultural group selection" as distinct from, though interacting with, biological group selection (Richerson and Boyd 1999; Turchin 2016). Summarizing the consensus at the influential 2012 Ernst Strüngmann Forum on cultural evolution (Richerson and Christiansen 2013), Turchin stated that "there was a great degree of consensus among the participants that cultural group selection is the only general mechanism for explaining how human sociality evolved that really has the logical coherence and empirical support" (2012, n.p.). Commitment to group selection correlates with liberal political views, while commitment to kin selection correlates with conservative political views. See Yaworsky, Horowitz, and Kickham (2015).

3. Segerstråle (2000) draws connections between conceptions of scientific and moral truth and their role in the sociobiology controversy.

2. The Research Program of Sociobiology

2.1. Technical Core: Kin Selection and Inclusive Fitness

First, consider the technical core facilitating the emergence of sociobiology as a distinct field and ideological project: the concepts of kin selection and inclusive fitness developed initially in articles by William Hamilton and published in 1963 and 1964. This approach was spurred in part by growing concern to challenge inchoate group selectionist theories (Wynne-Edwards 1962) by making accounts of individual natural selection rigorous and capable of explaining cooperative and altruistic behavior (Hamilton 1963, 1964a, 1964b; Maynard Smith 1964).⁴

Like good exemplars—concrete Kuhnian models that provide workable models for further scientific work—the papers provided a fruitful new basis upon which new work could be developed and extended to solve new puzzles. The new approach challenged prior conceptions of group selection that took behaviors that were adaptive at the group level as sufficient to explain their persistence without consideration of whether such behavior would be adaptive for individuals. In this sense, kin selection and inclusive fitness provided a more rigorous explanation for the emergence of “altruistic” behavior in animals, including humans.

A good example of altruistic behavior, as understood in evolutionary biology, is an animal vocalizing to warn the group of the presence of a predator. While the behavior benefits the group by helping it survive, it risks costing the signaling animal its life, thereby weeding out any genes for such “altruistic” behavior from the gene pool. The explanation for how altruistic behavior that was costly to the individual but beneficial to the group could emerge by natural selection was addressed by realizing that genetic kin would have a greater likelihood to share copies of altruistic genes contributing to the signaling behavior. Considering both direct fitness favoring individual reproduction and indirect fitness, which tracked the propagation of shared genes by kin, led to the solution developed by Hamilton.

2.2. Articulation of the Sociobiological Research Program

Such kin selection was generalized to develop a concept of inclusive fitness that explained adaptive evolution through both direct and indirect fitness

4. Wilson (1975b, ch. 5) presents Hamilton's approach as one among many approaches and seems to favor group selectionist approaches overall, although he would later describe his 1965 “conversion” to Hamilton's approach (quoted in Segerstråle 2000, pp. 54–5). Wilson's work is significant in reflecting and contributing to the growing interest in inclusive fitness (Segerstråle 2000, ch. 4).

effects, the latter requiring calculation of a coefficient of “relatedness,” r , that tracked shared genes among kin or others in the population. If the costs to direct fitness of the individual’s altruistic act were exceeded by the benefits to those sharing copies of the individual’s altruistic genes, then selection for the altruistic trait will occur (Hamilton 1964a; Wilson 1975b, p. 118).

All animal behavior that was “altruistic” in Hamilton’s terms was a product of what Richard Dawkins called “selfish genes” in his popular account of the new approach. For Dawkins, it is genes that are the target of evolution and individuals are merely the bearers, or “vehicles” of genes. Genes act as if they were intentional agents that aim to propagate themselves as the result of natural selection (Dawkins 1976).⁵

It is this account of altruism that would provide the basis for an expert on the social behavior of insects, E. O. Wilson, to develop a program for a new science of sociobiology. Applying the approach to humans in a final chapter, the publication of *Sociobiology: A New Synthesis* provoked a highly politicized debate on the scientific standing of the field and its political consequences. Key to the new approach was the view that human social cooperation was the result of root biological imperatives that had emerged to help biological kin (or others who shared identical copies of certain genes).

As a basis for research on human societies, it led to research testing kin selection in tribal societies, in a body of work that reinforced the split in anthropology between biological and cultural camps and spawned further controversy (Chagnon 1980; Dregger 2015, chs. 5–6). It also provided for the incursion of biological approaches within the social sciences. In the new field of evolutionary psychology, the identification of mental modules that evolved genetically within the ancestral foraging environments of humans constituted a shared biological nature that limited sociological variability. For such scholars, to “explain the social in terms of the social,” as cultural anthropologists did, was to commit the “Durkheimian fallacy” (Barkow 2006, pp. 16–7). For the new sociobiology and affiliated fields, human inequality was akin to inequality in other species, especially primate species.

Evolutionary psychology borrowed from Wilson the view that social organization was adapted to the demands of hunting and gathering in

5. Wilson (1975b, p. 3) had already developed this metaphor, suggesting that the organism’s “primary function is not even to reproduce other organisms; it reproduces genes, and it serves as their temporary carrier.” The separation in Hamilton’s formulation of direct and indirect fitness effects was used to show that both ostensibly “selfish” (direct) and “altruistic” (indirect) fitness effects can be seen to advance the interests of selfish genes, making altruistic behaviors cases of disguised self-interest.

the Paleolithic, which constrained current cultural behavior at the cost of societal dysfunction. Wilson agreed that aspects of our social organization may be a “phylogenetic vestige” (Wilson 1975b, p. 548) of foraging environments and that “human nature is to a large extent the heritage of a Pleistocene hunter-gatherer existence” (Wilson 1975a). On the other hand, he also put forth a model explaining rapid genetic evolution through a multiplier effect that could lead to changes in levels of aggression or other behavioral traits, tempering an emphasis on the Paleolithic emergence of an unchangeable human nature (Wilson 1975b, pp. 548, 11–3, 254–5; Segerstråle 2000, pp. 94–6, 264–5). In any event, Wilson rejected “the extreme orthodox view of environmentalism ... that in effect there is no genetic variance in the transmission of culture. In other words, the capacity for culture is transmitted by a single human genotype” (Wilson 1975b, p. 550).

By suggesting that small genetic differences could trigger large cultural effects, Wilson inverted Lewontin’s (1972) conclusion that humans share a common genotype that makes culture autonomous from natural selection, a view he had drawn from his study of human blood groups where between-group variation accounted for only 15% of the variance. For Wilson, this was enough to elicit genetic selection for cultural differences between groups, and showed that “genes hold culture on a leash” (Wilson 1975b, pp. 550, 569–74; Wilson 1978, p. 167; see also Hamilton 1975, p. 134). In this sense, Wilson’s *Sociobiology* set the pattern for two distinct trends in biologically reductionist approaches today. One argued that natural selection has continued to shape a genetic basis for cultural differences, thereby viewing cultural differences in quasi-racial terms (Cochran and Harpending 2009, pp. 156–8, 188–9). The other emphasized the relatively fixed characteristics of a shared human nature. Either view of culture “on a leash” puts limits on our capacity to invent egalitarian social forms in the present, so that the political lessons of sociobiology were to chasten “tabula rasa” Marxism.⁶

2.3. Political Dimensions of Sociobiology

The political position animating Wilson’s sociobiology was a form of liberal universalism that emphasized a mostly shared human nature, incorporating conflicting drives reflecting a tension between the individual and society (Wilson 1975b, pp. 254–5, 561–3). This conception of human

6. Wilson (2006, p. 168). Wilson (1980, p. 296) considers the question of which of these two views of culture on a leash (or the view that culture is “freed” from biological constraint and hence off the leash) is correctly an open question, but with the evidence pointing to continued genetic variability for behavioral traits.

nature put constraints on the extent of social change that was possible or subject to our conscious control, precisely at a time when activists were seeking radical changes in Western political arrangements and culture (Segerstråle 2000, p. 3; Jumonville 2002).⁷ Close readers would have noted that Wilson (1975b, p. 20) argued that significant variation exists for behaviors like aggression, but on a “behavioral scale,” which may vary by population density or other environmental characteristics. It is the entire scale not individual traits that are genetically determined. The emphasis on the “biological basis of all social behavior” nonetheless established that the emphasis in the social sciences on sociological and cultural variability had distinct limits that required correction by integration into the modern synthesis in biology (Wilson 1975b, p. 4).⁸ Wilson identifies the Marxism of his critics in anthropology and biology as responsible for their mistaken belief “that nothing exists in the untrained human mind that cannot be readily channeled to the purposes of the revolutionary socialist state” (1978, p. 191).

In a variety of suggestive examples and metaphors, Wilson put limits on the cultural variability put forth by many social scientists and challenges to Western political and cultural practices coming from the New Left. Moreover, he saw human nature as a series of tradeoffs, making ambivalence between altruistic and selfish tendencies central to human behavior and institutions, between “rights” and “duties” in liberal parlance. In so doing, Wilson directly challenged Marxist views that human nature was perfectible with changes in political economy (Wilson 1975b, p. 129). Put in this context, Wilson’s views paralleled the defense of liberalism against New Left politics and emergent identity politics by liberal critics who argued for the role for regulated markets, Western freedoms, and cultural assimilation of minorities into shared national cultures (Jumonville 2002, pp. 578–9).

What particularly animated critics of Wilson, like his colleagues at Harvard, Stephen Jay Gould and Richard Lewontin, and the Boston Sociobiology Study Group (SSG) formed in 1975, was the construction of what they saw as a non-Darwinian essentialism behind human nature that construed certain “negative” human behaviors as closer to our essential human nature than others. Gould found fault in the identification of aggression, war, hierarchy, and gender differences as aspects of human social relations

7. In opposition to the view that sociobiologists were generally right wing or reactionary, Segerstråle (2000, p. 3) argues that “[t]he actual dividing line went, rather, between a particular type of New Left activist on the one hand and traditional liberals and democrats on the other.”

8. See, for instance, the discussion of the “directedness of learning,” following Niko Tinbergen’s animal ethology, opposed to the concept of *tabula rasa* (Wilson 1975b, p. 156).

that were difficult to modify beyond certain limits (Gould 1977, pp. 16, 238–42, 251–3). Gould believed that our biological nature reflected a continuum of variation that could not be linked to one form of social organization or practice, especially in light of our cultural diversity as a species.

Although Wilson had actually recruited Lewontin to Harvard because they shared an emphasis on population genetics, with its emphasis on variation over essences, Gould and Lewontin saw remnants of typological thinking in his sociobiology that they considered pre-Darwinian (Segerstråle 2000, pp. 43–7). They objected to the “graded structure” (Lakoff 1987) implicit in Wilson’s approach, where certain social arrangements were truer to human nature than others, making possible an understanding of other societies that filtered them through the lens of Western assumptions (Gould 1977, pp. 258–9). Thus, Wilson’s account of human universals had to discount “uncomfortable ‘exceptions’ as temporary and unimportant aberrations,” such as nonviolent societies (Gould 1977, p. 254).

Drawing on his background as an activist and historian of science, steeped in Marxism, Gould identified Wilson’s view as another attempt to naturalize hierarchy and difference by the authority of science. Likewise, Lewontin noted that

[i]t is the claim of vulgar sociobiology that some kinds of human social organization are either impossible, or that they can be maintained only at the expense of constant psychic and political stress, which will inevitably lead to undesirable side effects because the nature of the human genome dictates a “natural” social organization.

By contrast, Lewontin argued that human cultural capacity, while emergent from biological evolution, is effectively decoupled from it. Not only can culture act independently from biology, but it can transcend biological limitations through technology or other modifications of the environment, challenging the assumption that “society is genetically constrained in an important way” (Lewontin 2010, p. 245).⁹

While Wilson reports that he was politically naïve at the time of the publication of *Sociobiology: A New Synthesis* (1975b), the critical response to sociobiology reflected the questioning of accepted liberal ideas that were hegemonic among most academics before the political ferment of the 1960s and 1970s. A crucial point of contention in the questioning of liberalism’s political innocence was the universalism associated with liberal

9. See, also, Gould’s (1977, pp. 256–7) claim that autonomous cultural adaptations explain Inuit sacrifice of the aged on ice flows better than kin selection.

views of humanity, which was challenged as harboring an ethnocentric, or even imperialist, mindset. In the context of US involvement in Vietnam and the pushback against the civil rights movement, liberalism looked to critics to harbor a false claim to universality that held up Western models as a solution for all societies, rather than ceding to them their own cultural and political autonomy. For Gould, Wilson presented a false view of human nature that saw market competition, unified national cultures, and Enlightenment conceptions of universal natural law as central to all societies, which are neglected at their peril (Jumonville 2002, pp. 578–9).¹⁰

Wilson fits in with one side of an ongoing debate about U.S. and Western exceptionalism, aligned with Cold War liberals who emphasized that capitalism and markets were innate to human nature, as opposed to Marxist emphasis on human ability to construct radically different social arrangements. Wilson drew on market metaphors in describing competition among both genes and people, describing high status !Kung as “exceptionally able entrepreneurs” and speculating about genes for success that separate economic classes (Wilson 1975b, pp. 549, 554–5). Like Daniel Patrick Moynihan, he emphasized the need for cultural integration of minority cultures into a larger national whole by shoring up the patriarchal family, eschewing anthropological relativism and its political twin, identity politics (Moynihan 1965; Jumonville 2002, pp. 579–80; Geary

10. In emphasizing Wilson’s liberal universalism, I follow Jumonville (2002), but reject his interpretation of Gould and the SSG as simply particularists, rather than universalists, across the board. Jumonville considers, but rejects, the thesis that Gould challenged Wilson’s universalism because his examples “were nothing more than Western social values projected onto all evolutionary history” (p. 589). Jumonville makes two interpretive errors here in rejecting this interpretation, which I endorse. First, he misses that Gould understood that the human species was unified biologically, rather than representing distinct sub-species or races, which is why he and Lewontin opposed the use of IQ tests to distinguish innate intelligence among human racial groups. Biological universalism, correctly understood, is compatible with great variation within the species—indeed, Gould’s view is that this was the crucial difference between Darwin’s understanding of variation and that of essentialist approaches like Wilson’s, which constructed graded conceptual structures where certain deviations are excluded as atypical or unrepresentative of the category. Second, the biological capacity for culture and the existence of a great variety of human behaviors and social arrangements meant that there was great cultural diversity among human groups, which could not be related to human biological causes. This goes directly against Jumonville’s representation of Gould’s multiculturalism as one where, in David Hollinger’s words, “culture follows the lines of shape and color” (p. 589). (In general, Jumonville relies on writers critical of multiculturalism like Hollinger and John Searle to describe the view, and it leads to significant distortions.) Gould’s own version of a shared biological identity for humans provides the basis for the construction of radically different ways of organizing human societies by culture. In short, culture is an emergent category distinct from its biological basis and this means biological theories of human social behavior will not work. See the discussion of Sahlins’ *The Use and Abuse of Biology* (1976) below, for which Gould wrote a blurb for the cover.

2015, pp. 7–10). By implication, to readers in 1975, social movements like communism, black power, feminism, and anticolonial movements were unnatural forms of politics that thwarted human nature. By contrast, liberal market societies, racial integration, and U.S. soft power abroad aligned with human nature.

3. The Research Program of Cultural Anthropology

3.1. Technical Core: Cultural Relativism

A key technical component of ethnographic work in cultural anthropology was the commitment to cultural relativism as a methodological tenet intended to help overcome ethnocentric bias in the anthropologist so that cultures can be objectively understood. At its core, cultural relativism seeks to explain cultures internally, by reference to its own frames of meaning, rather than by comparison with other cultures or standards, particularly that of the anthropologist. Since the work of Franz Boas, an emphasis on what came to be called cultural relativism served as a crucial methodology to objectively understanding other societies by overcoming the distorting lens of the anthropologist's own ethnocentric bias, especially the influence of racism and colonialism among Western societies (Johnson 2007, pp. 794–6). Thus, cultural relativism was often conjoined with an emphasis on the autonomy and variability of culture. Ethnographic observation of cultural variability showed that radically distinct ways of organizing culture exist. Ethnographic observation served to estrange assumptions about our own way of life, including political and sexual practices taken for granted in Western societies, so that cultural relativism was conjoined with a critique of Western cultural practices and ethnocentric attitudes. This often led to a backlash against cultural anthropologists for implicitly challenging the universality of European cultural mores, as in the controversy regarding Margaret Mead's description of promiscuity and free love among Samoans (Mead 1928; Freeman 1983, 1999; Shankman 2010, ch. 14; Jarvie 2013; Dreger 2015, ch. 5).

In Boas' original formulation, cultural relativism was a response to Western ethnocentrism that challenged contemporary pseudo-Darwinian stage theories dominant in the conception of culture put forth by nineteenth-century anthropologists such as Lewis Henry Morgan, which advocated for the progress of civilization and the displacement of lesser "races" by European society (Li 2001). Cultural relativism opposed the idea that human groups could be ranked according to societal stages that tracked success in a shared "practical reason" that engaged nature in instrumental terms. Anthropologists came to emphasize the distinctness of different cultures, each

of which was organized in ways that reflected its own inner logic that was conventional, not natural (Sahlins 1976a; Li 2001, pp. 209–12).

The fact that each culture had its own logic and rationale and that Europeans and Americans might realize that their own social practices were arbitrary put cultural anthropology in conflict with views that provided a biological basis for human nature and used such theories to explain why racism, sexism, and warfare were to be expected in human societies (Hamilton 1975, pp. 142–50; Wilson 1975b, pp. 564–8, 572–3; Dawkins 1976, p. 99). Crucially, Boas' program helped launch a methodological critique of ethnocentric assumptions in the practice of Western scientists that continued to shape cultural anthropology's attitude to reductive and scientific approaches to human behavior.

3.2. Articulation of Cultural Relativism in Anthropology

Anthropological studies of kinship showed that cultural variability extended to the identification and cultural role of kinship. Kinship systems are “fictive” and designed to promote cooperation in ways that extend beyond the bounds of strictly biological kinship, in contrast to the views of Chagnon and other “biological” anthropologists. Biological and cultural theories of kinship were opposed concepts employed by opposed camps in anthropology. In the Boasian tradition, culture was understood as arbitrary or conventional, rather than functional, as the British tradition following Malinowski argued.¹¹ Individuals are born into cultures and must adopt complete systems of meaning that are shared by one's social group and that differ widely across social groups.

Cultural constructions of kinship were used to facilitate cooperation in ways that deliberately opposed limiting cooperation to biological kin. On this view, Hamiltonian kin selection is quite simply falsified by the ethnographic record.¹² In Sahlins' words, the “cultural determinations of ‘near’ and ‘distant’ kin” are actively created in ways that “never conform to biological coefficients of relationship,” but nonetheless serve as “the effective structures of sociability in the societies concerned” (Sahlins 1976b, p. 25; see also Sahlins 2013). Anthropological studies of kinship provided the key basis for explaining social cooperation through distinct cultural

11. Despite this difference on the question of functionalism, the British tradition shared an emphasis on the ethnographic method as a means to overcome Western ethnocentrism (Malinowski 1922).

12. For criticisms of Sahlins' purely culturalist view of kinship, see Etter (1978) and Shapiro (2014). Since kin recognition may have evolved via a heuristic of a shared developmental environment, recent theories of nurture kinship are potentially compatible with inclusive fitness, despite this earlier incommensurability (Campbell 1983, p. 26; Holland 2012).

constructions of the human world, in effect denying that “explaining the social in terms of the social” is a fallacy, as evolutionary psychologists asserted. In this respect, Sahlins was holding the line against criticisms of the concept of culture and the breakdown of cultural holism within the anthropology profession in the 1970s (Li 2001, pp. 222–5; see also Lewens 2015, pp. 140–41).

Human societies, whether egalitarian or authoritarian, depend upon social networks that extend beyond band-level groups and define kinship and the consequent grounds for cooperation in ways that did not correspond to biological kinship. Cooperation and conflict among humans consequently go beyond “face-to-face” group defense of territories like those found among chimpanzees. Modeling human societies on primate dominance hierarchies would ignore this unique characteristic of human societies and shows the need for a study of human behavior distinct from biology and primatology, or animal ethology more generally.

3.3. Political Dimensions of Cultural Relativism

The political component of cultural anthropology’s working assumptions can be seen as a form of voluntarism, whereby humans actively create their own cultures. This implies that humans are not constrained by their biology; if they choose to organize their way of life differently, they may do so. Human inequality is a convention, if not a choice. To deny that human capacity to construct egalitarian societies by choice is a bad faith result of the adoption of biologically reductionist science, which itself is the consequence of cultural bias among expansionist Europeans (Castille 1975; Johnson 2007, p. 792).

Exactly how members of a culture are to bring about change in their culture was problematic, as there was a tendency in the Boasian system to see culture as a holistic system that outlives individuals. This can be seen in the dispute over Sahlins’ interpretation of Captain Cook’s death at the hands of Polynesians who, Sahlins argued, took Cook as their god, Lono. Sahlins allowed that Polynesians were capable of acting flexibly, interpreting their culture anew as circumstances changed. Where Sahlins’ solution involved a dialectical synthesis between agency and structure, his anthropological critics focused on his tendency to see agency as reinforcing, rather than undermining, the established cultural system (Obeyesekere 1992; Sahlins 1995; Li 2001, pp. 235–49). That being said, it was common to use the existence of cultural diversity to challenge Western society’s own cultural practices as conventional and changeable, a dynamic evident in Margaret Mead’s public role as an anthropologist criticizing Western social mores as a columnist for *Redbook* (Jarvie 2013, p. 533).

The emphasis on the diversity of cultures, each organized in ways that reflected the autonomy of culture, suggested that alternatives to Western

culture were possible. This emphasis on the possibility of alternative social and political arrangements was shared by other critics of sociobiology, though the level of voluntarism may differ from anthropologists like Sahlins. Both put an emphasis on the capacity to construct egalitarian societies, but some like Gould were less “utopian” than others, in Marx’s sense of making history under circumstances transmitted from the past (Dusek 2003; Allmon 2008).¹³ However, Gould’s political concern with sociobiology remained focused on its denial of human potential to change social practices, arguing that adaptive behavior may be the result of a faster, Lamarckian cultural evolution rather than Darwinian biological evolution. Such behavior could then spread across group barriers or be more easily modified than genetic traits (Gould 1980, pp. 264–6). Even cultural anthropologists realized increasingly that the societies they study are shaped by power structures. These power structures constrained individual agency in ways that qualify a characterization of culture as reflecting human choice (Smith 2002, p. 293).

Nonetheless, anthropologists emphasized that cultural change was common and cultural codes were imposed actively upon the world, rather than reflecting a causal process distinct from human self-understanding (Johnson 2007, pp. 798–9). Anthropological debate about the exact relationship between structure and agency proceeded under the generally shared assumption that human agency actively constructs cultures, as evidenced by the wide diversity of cultures that exist. This view was only reinforced by the importation of linguistic structuralism into anthropology, with its emphasis on the role of an arbitrary connection between the linguistic sign and its referents. Applied to culture, this view reinforced relativism by emphasizing that “patterns of culture ... had no necessary connection with material life” (Webster 1989, p. 37; Sahlins 1976a).

On this view, what caught cultural anthropologists’ ire about sociobiology was the idea that biology constrained what culture can do, behind the backs of actors. For Sahlins (1976b), in his influential critique of sociobiology, human kinship was not a biological constraint but a conscious cultural activity that patterned human relations in ways that reflected what he later called an emergent “mutuality of being” (Sahlins 2013). As a result,

what human beings were selected for is the ability to organize their lives meaningfully, which meant that they couldn’t organize it physically. That is, we can’t marry on the basis simply of physical or genetic dispositions, because who is marriageable in terms of kinship

13. Segerstråle (2000, p. 142) summarizes the viewpoint of the SSG as the view that we “should be seen as free agents, having choices ... The emphasis was on the lack of biological constraints on the development of human culture.”

or otherwise eligible or attractive is symbolically defined, different in different times and places, but everywhere fundamental to human marriage. (Quoted in Smith 2002, p. 292)

Unlike an emphasis on either biological or cultural evolution, this view maintained a methodological commitment to relativism, since explanations of human behavior should be related to the cultural context that gave rise to it and not explained by some adaptive function explicable by general Darwinian laws (Smith 2002, p. 294).

A subsidiary element associated with the politics opposed to sociobiology was a challenge to orthodox, reductionist science. For Sahlins, this entailed an understanding of the science of anthropology that opposed sociobiology's focus on general laws subsuming particular cases, as well as the assumption that more basic sciences should explain higher ones (Sahlins 1976a, 1976b, pp. 63–7). Other critics of sociobiology developed non-orthodox accounts of science as a reflection of the class societies they were a part of rather than a methodology for objectively transcending politics (Moore 2008, ch. 6). Every effort to appeal to biology to explain human difference was considered to lead to an abuse of science to benefit the powerful, a constant temptation in the history of Western science (Lewontin 1970; Gould 1981; Sahlins 1976b, p. 78). The emphasis on defending differences, like the anthropologist's relativist concept of culture, set the stage for the rise of identity politics, postcolonialism, and multiculturalism, just as the concept of culture was being criticized by anthropologists (Smith 2002, pp. 291–92).

4. Incommensurability between Sociobiology and Cultural Anthropology

Because incommensurability blocks logical comparison, in practice it functions to differentiate social groups within science that have distinct and contrasting representations of the natural world that cannot be compared to a neutral account of the facts (compare Jordan 2015). Sociobiology and cultural anthropology were incommensurable in this sense. The core ideas associated with each functioned like ethnic markers do in the cultural evolution literature, as distinct signs associated with a research field's core group and its underlying research program. Together these signs help each group define legitimate insiders and deluded outsiders (Collins 1985; Boyd and Richerson 1987).

However, developments in each field set the stage for a hybrid program that accepted an evolutionary account of humans, modified to include two distinct types of evolutionary change, genetic and cultural. When the treatment of culture shifts from an autonomous creation of distinct cultures to a

distinct mode of inheritance sharing features with genetic evolution, previous treatments of the biological foundations of culture can also be reconfigured. Internal changes to the research program defining what constitutes a good contribution to ongoing scientific work can change how compatible or incompatible distinct approaches are understood to be.

Consider how the technical articulation of inclusive fitness in sociobiology led to the deployment of the concepts of selfish genes and memes by Dawkins. Dawkins, as also E. O. Wilson in his collaboration with Charles Lumsden (Lumsden and Wilson 1981), developed approaches to cultural evolution that modified core assumptions from sociobiology and provided a (shaky) bridge to cultural anthropology for those willing to take the bait.¹⁴ In coining the term meme to represent a unit of cultural evolution akin to the role of the gene in biological evolution, Dawkins (1976) worried that memes might not have the fidelity of transmission that genes possess. Fidelity of transmission is vital if an evolutionary process is to take place, since otherwise the environment cannot select among stable replicators, whether genes or memes, and adaptive change cannot take place. Since different individuals might have very different understandings of the same mental concept, in what sense can we say that units of cultural inheritance are passed down reliably?

The answer is clear to Wittgensteinian sociologists of science: it's not abstract mental concepts that are passed on but rather socially enforced rule-following behavior (Bloor 1983; Collins 1985). Competent members of the group enforce the observable behavior associated with group norms and rules. Different, private mental interpretations of a rule or norm are not discoverable. What can be observed is rule-following behavior that the group recognizes as in conformity with the rule. This "sociological" interpretation of Wittgensteinian forms of life explains how apprentice scientists learn the right way to go on in their local communities (Lynch 2005). Distinct scientific communities can embody quite different and incommensurable rules and norms.

The sociologist's answer to how cultural transmission takes place is compatible with the norm psychology developed by proponents of cultural evolution like Robert Boyd and Peter Richerson (Boyd and Richerson 1994, 2002; Henrich and Boyd 2001; Chudek and Henrich 2011). Accurate transmission of culture in humans is made possible by the genetic evolution of the human capacity to imitate group members, especially prestigious and successful older members of the group. Joseph Henrich

14. Note that Wilson (1975b, p. 14) had already referred to the evolutionary role of ideas among humans in discussing "tradition drift," citing Cavalli-Sforza and Feldman's work that had established already the basic principles of cultural evolution theory.

and colleagues developed this research through developmental studies of children learning social norms and psychological experiments extending beyond captive undergraduates to include groups studied by anthropologists. In the process, they have shown how a prestige-biased imitation system among humans makes possible the accurate transmission of culture in answer to Dawkins (Tomasello 1999; Henrich, Boyd, and Bowles 2004; Larson 2010; Ensminger and Henrich 2013).¹⁵

The system works well enough that even young children quickly internalize and enforce norms that they have just learned (Henrich 2016, ch. 4). For Henrich, the socially conservative aspect of the acquisition and enforcement of norms ensures that culturally adaptive packages are developed and maintained that are causally opaque to individuals. Without this collective enforcement of shared norms and deference to prestigious models, the cumulative cultural evolution across generations, that makes us “smarter” as a collective than we are as individuals, would not be possible.

In short, our intelligence as a species is not attributed to individual rationality, but to the slow accretion of cultural changes that accumulate, because together they help groups survive. It is not distinct “memes” coding for cultural traits that are selected for, but packages that function well together where the components may or may not be necessary to the adaptive function as a whole. The use of comparative experimental ethnography to study social norms suggests that the emergence of complex societies selected for norms of fairness facilitating cooperation among non-kin. Pro-social religions with gods who punish wrongdoers and societies with significant market integration both correlate with greater internalization of norms of fairness and greater willingness to punish norm violators (Ensminger and Henrich 2013, pp. 89–90).

This supports a conservative account of culture, evident in norm psychology’s focus on imitation of prestigious elders. Individual elements of complex cultural adaptations are jettisoned at the risk of undercutting elements that help maintain the adaptive function as a whole, though they are causally opaque to individuals or to other cultures. Henrich (2016, ch. 3) demonstrates this at length with stories of stranded European explorers unable to survive without local informants to show the way. In a similar fashion, when complex dietary processes are borrowed by other societies, they often leave out key elements that ensure health, as American southerners found when they failed to process corn with added lime and ash, developing the nutritional disease Pellagra as a result. A corollary is that cultural evolution theory must also take on board the critique of the

15. For critical discussion of conformist and prestige-based models of cultural transmission, see Lewens 2015, ch. 6.

adaptationist program in biology by rejecting the view that all aspects of culture are adaptive.¹⁶

It should be noted that while this evolved norm psychology provides for generally accurate transmission of culture, it does not transmit with 100% accuracy any more than do genes, which are subject to copying errors, some of which are corrected for by other genetic and epigenetic processes. For cultural evolution, this means that enforcement of group norms can disguise divergence over time, especially as groups separate geographically. In science, the equivalent of speciation can occur to the extent that shared understandings can give way to incommensurable perspectives as groups diverge over time (Fuller 1988).

Unlike speciation, however, human culture allows for hybridization across group lines as cultural elements are borrowed and adapted to different uses. Incommensurability in this sense alters the flow between cultural packages in science, alternately protecting research programs from competition with powerful rivals or allowing for the spread of distinct approaches that cultural “blending” would destroy. Endogenous changes in research programs can also set the stage for dismantling incommensurability as epistemological packages get changed piecemeal in ways that make later integration possible. It is just these kinds of changes that have made possible the development of cultural evolution theory that was previously blocked by the standoff between sociobiologists and cultural anthropologists.

5. Incommensurability Exhibited and Transformed

Anthropologists and sociobiologists disagreed over the primacy and autonomy of cultural or biological explanation. Sahlins understands Wilson to argue that “any Durkheimian notion of the independent existence and persistence of the social fact is a lapse into mysticism. Social organization is rather, and nothing more than, the behavioral outcome of the interaction of organisms having biologically fixed inclinations” (Sahlins 1976b, p. 5). By contrast, Sahlins sees the biological character of human beings as entirely “infrastructural,” in the words of Gintis (2010), such that cultural explanation of behavior should proceed without reliance upon the lower level of biological explanation, just as biological explanation should proceed without reliance upon physics. Where Wilson depends upon questionable reductionist assumptions about the relationship between the

16. Gould and Lewontin 1979; Richerson and Boyd 1992, pp. 75–85. Fracchia and Lewontin (1999) have subjected cultural evolution theory to criticism paralleling their critique of adaptationism in biology. For a qualified defense of cultural evolution in this regard, see Lewens 2015, ch. 8.

sciences, Sahlins' antireductionist understanding of emergent levels denied the significance of interaction between levels.

The belief that certain technical issues have been settled once and for all within scientific research programs leads to jaundiced views of new kinds of arguments that seem to insiders to violate these taboos. The revival of group selection arguments by David Sloan Wilson and Elliott Sober—as also later by E. O. Wilson himself—were interpreted by sociobiologists as a return to the flawed arguments of group selection that inclusive fitness was believed to have routed in the 1960s. This is the case even though they can be viewed as a reinterpretation of the applicability of George Price's equation, from which Hamilton's equations can be derived, to the relative balance of individual and group selection, suggesting conditions where group selection may indeed overcome the strength of individual selection (Hamilton 1975; Sober and Wilson 1998, pp. 71–7; for the application to cultural evolution see El Mouden et al. 2014).

Defenders of inclusive fitness theory now deny that group selectionist arguments are mathematically distinct from inclusive fitness theory, as Hamilton's coefficient of relatedness in his equation for inclusive fitness is understood to include group dispersal processes affecting genetic relatedness within the power of its mathematical expression. For defenders of inclusive fitness orthodoxy, kinship selection, including the calculation of relatedness by the well-known fractions $1/2$ and $1/8$ for siblings and cousins, were simplifications for well-mixed populations. So-called group selection arguments, as also cultural evolution theory sometimes associated with it, flowed from basic misunderstandings of the power of inclusive fitness theory (West, El Mouden, and Gardner 2011). Critics of inclusive fitness theory returned the favor, arguing that newer approaches had smuggled in tacit group selection in extending Hamilton's concept of relatedness beyond its original applicability, as well as failing to be accurately subject to empirical testing (Wilson 1998; Nowak, Tarnita, and Wilson 2010; Nowak 2011; Nowak and Allen 2015; see also Sober and Wilson 1998, pp. 31–50, on the “averaging fallacy”).

On the other hand, the new approaches to cultural evolutionary theory of Cavalli-Sforza and Feldman (1981) and Boyd and Richerson (1985) were interpreted by cultural anthropologists as a return to the stage theories of cultural evolution that the Boasian tradition had displaced from primacy in anthropology. The accompanying tendency to develop an interactive approach in terms of “dual inheritance theory” or “gene-culture coevolution” transgressed Sahlins' strictures against violating the autonomy of hierarchically distinct sciences. Rather than debating whether real biological kinship or constructed, “fictive” kinship shaped behavior, cultural evolutionists saw the biology of kin selection as the “hook” that allowed

cultural constructions of kinship to have their effect in organizing cooperation beyond kinship groups. Likewise, the emphasis on the inherent cultural agency of humans, combining themes from Boasian cultural relativism with structuralist emphasis on the arbitrariness of signification, implied that Darwinian explanations, even if cultural rather than genetic, would provide explanations that inappropriately went “behind the backs” of human cultural actors (Webster 1989).

As for the political valence of cultural evolution, one could argue that the failure of the political ferment of the 1960s and 1970s to radically change the world had tempered the voluntarism or radicalism of cultural anthropologists and Marxist evolutionary biologists, while the growth of identity politics in the academy ensured wide opposition to biological reductionism. Or, one might follow Etter, who suggested that the environmentalism of Sahlins and the SSG was “a manifestation of a remarkable and untenable vision of human omnipotence, perhaps linked to particular conditions of economic expansion,” which has now given way to austerity and political reaction (Etter 1978, p. 168). One might also consider the significance of increased levels of interdisciplinary cooperation and co-authorship in science itself for making plausible the thesis that human cooperation is a cultural project that transcends kinship.

Science can be seen to be undergoing a transition akin to the transition from band and tribal groups to modern complex societies and states, as wider social networks and bureaucracy transform small-group, “core set” researchers at a field’s frontier (compare Shapin 1994 and Porter 1996). The theory of cultural evolution is itself one example of this trend, where theoretical schemas get reconfigured and transported across distinct, traditional disciplines, but with the consequence that scientific reputations are no longer adjudicated by “band-level” personal judgments of small core sets on the cutting edge of a well-defined disciplines.

The relationship between biological and fictive kinship can be seen as similar to other ways that genetic and cultural evolution interrelate. Kinship relations are not just cultural “ideas” but relationships that are activated by particular activities and patterns of interaction. Particular forms of cooperation in humans, especially the extended social networks going beyond face-to-face bands, depend much more on bonds created by shared rituals and affinal ties (in-laws) than blood ties (Flannery and Marcus 2012, p. 164). This does not mean that kin-based altruism does not exist, but instead that the genetic system for kin selection is jury-rigged by cultural evolution in adapting to different local contexts.

Consider similar examples where human traits had previously been allocated to distinct spheres as hard-wired biology or cultural software. It is now common to recognize that literacy is a cultural adaptation that

rewires the brain in ways that bring real biological differences, evident in brain scans that vary across different languages. The point, however, also extends to spoken language, as languages are studied as culturally-evolved systems that vary dramatically over time and bring about biological effects on the brain independent of genetic evolution (Bolger, Perfetti, and Schneider 2005; Dor 2015; Henrich 2016, ch. 13). In this sense, grammatical forms emerge in the same ways that technical toolkits do, through cultural adaptation to changing environments rather than emerging full-blown as a genetic trait. Instead of focusing on a hard-wired human nature that evolved in evolutionary psychology's environment of evolutionary adaptedness (EEA), setting constraints on what kind of societies can emerge, the focus is on a genetically evolved capacity for culture that facilitates a different level of rapid and cumulative evolutionary selection.

6. Cultural Explanations for Egalitarian Societies

The diversity of cultural forms is built upon a shared social architecture making it possible. This approach can be seen most clearly in the coming together of anthropological and archaeological approaches to explain the emergence of complex societies, states, and class stratification from egalitarian foraging societies (Flannery and Marcus 2012). Instead of primarily emphasizing mismatch between social practices in the EEA and modern societies, the new approach emphasizes that: a) the deployment of social norms among Paleolithic foragers already undercuts the primacy of a genetically-evolved human nature, and b) cultural evolution as its own inheritance system implies that the emergence of complex societies since the Neolithic revolution are no less adaptive than foraging Paleolithic societies.

Developing the first point, even Paleolithic foragers deployed social norms that modified biological imperatives, alternatively reinforcing, extending, or frustrating them. It can be said that mismatch between societal demands and biological human nature is inherent to our species and not a result only of the emergence of complex agricultural societies. The corollary is that the "egalitarian" societies of nomadic foragers and some horticultural tribes identified by anthropologists are not spontaneous and natural expressions of human nature but societies built with carefully honed cultural practices that must periodically fight off the resurgence of primate dominance hierarchies.

The key transition between "natural" and "cultural" understandings of egalitarian societies can be found in Christopher Boehm's *Hierarchy in the Forest: The Evolution of Egalitarian Behavior*, a work spurred initially by his collaboration with Donald Campbell, whose work in evolutionary epistemology and evolutionary approaches to sociology anticipates key elements

of current cultural evolution theory (Campbell 1965; Boehm 1999, p. ix; see also Knauft 1991). The key insight of Boehm's work is that egalitarian societies are maintained by coalitions that act to protect their groups against the rise of "upstarts" who would convert the group into a standard primate dominance hierarchy with an alpha demanding obedience. Members of egalitarian societies act collectively to use the innate tendency of domination and submission itself against the would-be alpha.

Boehm (1999) called this "reverse-dominance hierarchy" the "dominance of the rank and file" since the group uses primate dominance hierarchies to new purpose by dominating would-be alphas to the point of ostracizing or killing them, if necessary. Flannery and Marcus (2012) supplement the point by identifying what could be called "fictive alphas," where ancestors or gods function as the alphas that are owed obedience. The rank and file (and/or groups with beliefs in supernatural alphas) exploit the capacity to construct dominance hierarchies against would-be alpha "upstarts" and in the process shape a new kind of primate society without individual dominance of group members.

In developing his analysis of egalitarian social systems, Boehm argued that conscious group decisions like whether to go to war or how to respond to resource shortage, provide a set of nested decision alternatives that serve as the elements among which cultural selection takes place, by influencing group survival and propagation in a way that overwhelms individual selection for cheaters over cooperators (Boehm 1996, p. 774–5). Warfare has been postulated to play the role of favoring group selection for cooperation over individual selection against it (Bowles 2009), but foraging societies probably did not engage in intensive warfare.¹⁷ If true, intergroup competition in warfare may have lacked sufficient time to promote a genetic basis for altruism and cooperation, though cultural group selection via Neolithic warfare could be sufficient to explain the emergence of complex societies and their "ultrasociality" going beyond assisting kin (Turchin 2016).

Since natural selection targets phenotypic variation rather than underlying genetic variation directly, anything that narrows phenotypic variation can change the balance between group and individual selection, not just warfare. Proposed candidates for this group selection-enhancing mechanism in humans include conformist transmission of culture (accepting authoritative cultural practices without question), conscious efforts to level political hierarchies, and active efforts to attain consensus for important decisions in the group (Richerson, Boyd, and Henrich 2003; Boehm

17. Boehm argues explicitly that his theory counters Wilson's claim in *Sociobiology* that high mortality and genocide would be necessary in human prehistory to activate group selection mechanisms in humans (Boehm 1996, p. 777).

1996, p. 775). Human sharing of food and information may have first provided the impetus for the emergence of human culture as a form of “rule-governed and morally encoded social control among conspecifics who are only distantly related” (Knauff 1993, p. 243).

Crises threatening egalitarianism in foraging societies are common and as a result it becomes possible for unequal societies to emerge by piecemeal modifications of the egalitarian ethos. This is why Flannery and Marcus title their recent synthetic treatment of inequality in human societies, *The Creation of Inequality: How Our Prehistoric Ancestors Set the Stage for Monarchy, Slavery, and Empire* (2012). They understand the transition from egalitarian to class-stratified societies as a piecemeal modification of the common underlying “social logic” of egalitarian societies. In terms of the approach to cultural evolution discussed above, the development and transmission of norms constraining behavior fits well with Flannery and Marcus’ use of the term “social logic” that is applied to the cultural rules behind egalitarianism and its modification over time. In this sense, Flannery and Marcus’ account can be understood as part of the process of cultural adaptation to new environments. On this view, the transition to hierarchical societies did not involve simply the repudiation of human nature by agricultural societies, resulting in psychological “mismatch” (Barrett 2010), nor is the rise of hierarchical societies the natural expression of primate dominance and kin selection that underlie all social forms.¹⁸

The second point about “mismatch” is that complex modern societies may be adaptive via cultural evolution, whether or not we possess evolutionary psychology’s “stone-age minds.” The fact that cultural evolution represents its own mode of inheritance, via the transmission of social norms and meanings, means that complex cultural adaptations that emerge over time represent workable ways of organizing human societies despite their departure from foraging lifeways. While such societies might employ a variety of “work-arounds” (Richerson, Boyd, and Henrich 2003) to redirect human nature to new kinds of social behavior, so too do the original foraging societies of the Paleolithic era. No simple “mismatch” between ancestral and modern environments exists. Rather, ongoing and changing cultural adaptation to new environmental challenges relies upon the human capacity to pass on cultural packages.

Cultural evolution is also expected to significantly change the selection environment for biological evolution such that rapid biological evolution

18. For the argument that kin selection and reciprocity are insufficient even to explain levels of human cooperation among kin, without supplementation from cultural norms, see Mathew, Boyd, and Van Veelen (2013).

can take place to the novel environments created by cultural evolution. This makes gene-culture coevolution an especially rich version of the influence of niche construction on the behavior of species. In niche construction theory, influenced in part by Lewontin's critique of adaptationism challenging static pictures of environmental selection (Burghardt and Laland 2017), animal behavior itself transforms the environment inhabited by the species (think beavers building dams), altering the selection environment shaping further genetic evolution in a directed fashion (Odling-Smee, Laland, and Feldman 2003). Human cultural evolution is an enhanced kind of niche construction since cultural norms accumulate over time, constituting complex suites of behavioral norms that alter the niche more significantly than behavior that is not passed down or accumulated.

The political assumptions emerging with this hybrid program of cultural evolution are less sanguine about our species' spontaneous capacity to construct and maintain egalitarian societies. Egalitarian human societies are possible, but fragile, particularly at moments of significant population growth, intensification of natural resource use, or the emergence of sedentary and agricultural societies. Both hierarchical and egalitarian societies are explicable as the result of cultural modification and descent. Human societies can cycle between egalitarian and hierarchical forms (Flannery and Marcus 2012, pp. 195–204; see also Wengrow and Graeber 2015). While class stratified, authoritarian societies have dominated for the last 5,000–10,000 years, modern democratic societies exhibit partial revival of egalitarian sensibilities, albeit within the context of bureaucratic and class-based societies.¹⁹

Promotion of human equality will not be accomplished purely by an act of will, but understanding of the egalitarian ethos and its limits can encourage vigilance against the potential of “upstarts,” particularly in moments of global political and economic crisis. Since the egalitarian behavior of nomadic foragers is no longer understood as a spontaneous and harmonious expression of an innate human nature, or the expression of a cultural logic adopted once and for all, a kind of conflict theory of human nature emerges (Campbell 1983; Richerson and Boyd 2000; compare Collins 1975).

7. The Emergence of Hierarchical Societies

If cumulative cultural evolution enabled the development of cooperative societies ruled by the rank and file, Flannery and Marcus (2012) present an extended treatment of how the opposite transition can be understood

19. See also the discussion of the rise of “axial” religions favoring human equality (Bellah 2011; Turchin 2016).

culturally, reflecting the active pursuit of status and not simply an automatic demographic or ecological effect of the transition to agriculture. They show how the egalitarian ethos was replaced by a hierarchical one step by step via slight “mutations” in the egalitarian code. In essence, inequality emerges as an exaptation of equality.

Egalitarian groups without clans like the !Kung, the Hadza, or the Netsilik Inuit developed extended social networks that ensured survival by sharing meat or engaging in reciprocal gift-giving with “honorary kinsmen” (Flannery and Marcus 2012, pp. 25–6, 34–5). The emphasis on reciprocity and social obligation built upon an egalitarian logic but could be converted to an inequalitarian one in societies where some individuals were able to accumulate more social obligations than the norm and others were left unable to reciprocate gifts. The emergence of “Big Men” from acephalous societies reflected an asymmetry in the capacity to give gifts, which is why many fiercely egalitarian societies proscribed excess or disproportionate gift-giving in the first place. In some cases, debt peonage emerged from unpaid social debts in societies still committed to egalitarianism (Flannery and Marcus 2012, pp. 551–4, 74–83, 199–200).

With the formation of clans and lineages, foragers inducted men into ritual mysteries. By itself, this did not imply inequality among adult men, and clans would initially be seen as equal to one another. However, extended trade networks in ritual goods gave the potential for some individuals to gain renown as “entrepreneurs” and for clans to distinguish themselves, which would set the stage for inequality to emerge (Flannery and Marcus 2012, pp. 53–5).

Flannery and Marcus develop a comparative anthropological description of the underlying social logic of modern foraging and agricultural societies, which they use to identify the kinds of artifacts one might expect to find in comparable societies in the archeological record. Examining the “transitional forms” of achieved and ascribed status in the ground allows them to develop a model of how different social forms developed in a fitful process subject to contestation and reversal.

In general, they argue that highly egalitarian societies transitioned first to societies where “achievement” was a highly valued basis for individual status, based upon cross-culturally similar concepts of life force, bravery in battle, or expertise (Flannery and Marcus 2012, pp. 208–10, 220–21). In achievement-based societies, status hierarchies emerged that had previously been flattened by cultural sanctions against egoism. Achievement societies allowed some degree of inequality to emerge, but the greater influence of some individuals could not be passed on to offspring and was tempered by a continuing commitment to equality, at least among adult males (Flannery and Marcus 2012, p. 96).

For Flannery and Marcus, egalitarian societies were not free of dominance hierarchies, but depended upon gods and the spirits of ancestors to play the role of alphas and betas who would punish those who violated social norms. For hereditary inequality to emerge, the power of these fictive alphas and betas had to be connected with high-status individuals through ritual objects such as crests or sacred bundles, that could be passed on to offspring and define control of the sacred mythology of a lineage. The construction of sacred objects was also a tool in the struggle to define one lineage as dominant over other lineages (Flannery and Marcus 2012, pp. 80–3, 173–6, 197–9).

At early Near East archaeological sites like Jericho, Çayönü, and Göbekli Tepe, the emergence of religious temples or ritual buildings with skulls of revered ancestors left material clues behind that corresponded with ethnographic observation of societies like the sedentary, foraging Pacific Northwest Nootka or horticultural New Guinea societies (Flannery and Marcus 2012, pp. 76–7, 110–38, 187–95). The correspondence suggested that lineage and clan-based societies began to appeal to ancestor spirits to justify authority for their living descendants. By the time burials of children—too young to have achieved status through their own efforts—show up including statues of ancestors or luxury goods, the case for hereditary inequality is strengthened (Flannery and Marcus 2012, pp. 265–6).

Moreover, in hereditary ranked societies lineages themselves were separated into higher or lower levels, by converting the forager's rule that late arrivals should defer to those who utilized a resource first to the rule that junior lineages splitting off from original ones were inferior (Flannery and Marcus 2012, pp. 86, 323). Combine this with clan-level rather than family-level revenge for murder and the emergence of ritual secrets requiring initiation, and the roots for individual and group hierarchy were set (Flannery and Marcus 2012, p. 55). Foragers with the capacity to store food and early horticultural societies abandoned norms against hoarding, which also set some families up for greater success and wealth (Flannery and Marcus 2012, pp. 92–6).

Still, even early agricultural societies struggled to balance prestige and equality. Flannery and Marcus examine social conflict accompanying the effort by some to exploit the shift away from immediate-return foraging to agriculture as justification for hereditary authority. Early horticultural societies did not accept this power grab as a necessity:

Those struggles show us that hereditary inequality is not something that appears spontaneously once population has increased, or agriculture has produced a surplus, or people have accumulated lots of shells and pigs. Inequality is orchestrated. At the same time, it is not enough for one segment of society to demand privileges for itself and its heirs. Would-be nobles need leverage, an advantage of some

kind, or their privileges will be taken back by the rest of society. This is presumably why so many societies remained achievement-based for thousands of years (Flannery and Marcus 2012, p. 207).

Hereditary rank seems to show up at least by 7,000 years ago in Mesopotamia and Egypt and by 3,000 years ago in Peru and Mexico. These societies converted achievement societies' emphasis on life force, expertise, or bravery in battle into ritual manipulation and control, managed by priests, warriors, or skilled craftsmen (Flannery and Marcus 2012, pp. 207–10, 397–9).

Kingdoms and empires extended control over larger areas, which depended upon the emergence of centralized capital cities and regional administrators (Flannery and Marcus 2012, pp. 346–7, 374–93, 555–7). Bureaucratic states emerged leading to a new level of control with the Sumerians, who stripped commoners of residual egalitarianism through political control and economic impoverishment. Legal regulation of marriage and everyday life, taxation, sumptuary laws, privatization of land, and high-interest loans all led to political serfdom and greater economic inequality (Flannery and Marcus 2012, pp. 475–502). The complexity of these highly stratified societies played a role in their survival, as societies capable of supporting conquest and trade would conquer or displace weaker ones.

Through all these developments, we can see the transmission and selection of culture. Transmission of culture takes place via stepwise changes in social logic (analogized to DNA by Flannery and Marcus 2012, p. 547), but also by the use of ritual objects, buildings, and symbols that accreted meaning over time in ways that reinforced the social logic justifying hierarchical stratification. Unlike the emphasis on the autonomous construction of culture in the Boasian tradition, Flannery and Marcus delineate an approach where convergent evolution takes place in the cultural realm, even though local conditions and cultural phylogenies shape cultural differences in ways that still require thick description. The model here combines an evolutionary and ecological approach to cultural evolution that shows that cooperation—even cooperation in exploitation and imperial conquest—depends upon mechanisms of cultural selection that go well beyond kin selection.²⁰

8. Conclusion

I have shown how research programs incorporating kin selection and cultural relativism differed in ways that fit Feyerabend's conception of

20. Compare Wilson et al.'s (2017) call for a combined evolutionary and ecological approach to the study of religious diversity or Jordan's (2015) treatment of foraging societies' technological traditions, where close archeological and anthropological examination of descent with modification shows varying degrees of isolation or hybridity across distinct technological traditions.

incommensurability by failing to allow a direct standard of comparison between the two approaches (Helmut and Oberheim 2016). At the same time, Feyerabend's conception is rooted in the insight that the generation of competing theories with different observation languages was needed to bring about criticism of established perspectives that would not break down on their own and would ultimately impede science by fostering conceptual conservatism (Feyerabend 1995, p. 141; Oberheim 2005). While incommensurable programs could function to allow "breathing space" to views that would not otherwise be able to defend themselves from dominant theories, successive theories could be modified by bilingual theorists and incorporate elements of competing perspectives (Feyerabend 1970, 1978). Thus, Feyerabend did not accept Kuhn's view that paradigms would remain incommensurable. Lakatos had argued that the strength of a research program at any moment of time is a function of its fruitfulness, its ability to generate new predictions some of which are corroborated. Feyerabend returned the focus to theories because he believed that research programs did not, and should not, remain distinct.

In the terms of cultural evolution theory, this amounts to the claim that cultural transmission in science does not just occur by vertical transmission between generations of scientists trained in distinct research programs, but can also occur in a horizontal fashion by transmission across research programs and the construction of hybrid approaches.²¹ Thus, on Kuhn's view, cultural transmission in science depends upon a single lineage in a mature field. Lakatos allows that there are multiple, competing lineages but focused predominately on vertical transmission. Feyerabend argues for multiple, competing lineages that can sometimes fuse or blend, reflecting a more complex view of the cultural evolution of science.²²

Where a view of the cultural evolution of science developed here differs from many approaches to evolutionary epistemology is in the assumption

21. It is important to note that hybridization can only occur here through the construction of new theories that are produced causally by directly drawing upon separate theoretical lineages, which is different from similarity produced through convergent evolution. For an argument that "cross-lineage borrowing" is rarer in the cultural evolution of science than appearances would suggest, see Hull (1988, pp. 450–52).

22. Hull argues that the cultural evolution of science has been rejected by many because they accept a simplistic view of biological evolution reflecting a bias towards the exceptional case of evolution among vertebrates with distinct lineages (Hull 1988, pp. 430–31, 440, 449–50). A view of cultural evolution incorporating something like the complexity of approaches applied to biological evolution under the umbrella of the Extended Evolutionary Synthesis (Pigliucci and Müller 2010) moves beyond Boyd and Richerson's (1985) application of mathematical models from population genetics to understanding cultural transmission to a thicker notion of culture, incorporating ethnography, experimental psychology, and historical methods. See also Lewens (2015, pp. 42–3, 144, 164–7).

that selection of theories within science acts as a simple proxy for truth. A little noticed corollary of Lakatos' view is that progressive research programs are less oriented to truth simpliciter than to the group activities of scientists: progressive programs allow scientists to carry out and modify piecemeal a research program driving their activities. In short, a good research program gives scientists something to do while taking for granted a host of assumptions about the world that have evolved over time to work well together as a package. Like any good cultural adaptation, the research program fits a specific niche rather than the world as a whole, and participation in the research program draws on the human ability to copy the approach of prestigious elders (Wilson 1990).

In the competition between kin selection and cultural relativism, distinct research programs drove research in ways that led to different assessments of the technical work that should occupy scientists and to drastically different accounts of human nature. As such, they may be considered incommensurable in Feyerabend's sense, without being permanently separate worlds as Kuhn thought. For Feyerabend, this was the case because incommensurable perspectives as distinct language-based practices made use of their separate constructions of the world to facilitate breathing space for new perspectives that would otherwise be crushed by dominant approaches and to facilitate qualitative change in the observation language applied to the world (Feyerabend 1970, 1978).

The latter view involved a recognition that mechanisms were needed to avoid "overadaptation" in science by conceptual innovation that went beyond merely refining the fit between well-developed theories and the world (compare Hamada 1991). Galileo's invention of a new "observation language" for describing motion is a case in point, as it involved a series of simple factual errors as understood by the Aristotelian science of the time. Only later, with the development of Galileo's alternative program, did a new cultural package develop that would not only see the world differently, but would enable fruitful development of a new research program that would transform the ecology of science as a whole.

Feyerabend (1978, pp. 114, 225, ch. 12) did not argue that Copernican and Ptolemaic mathematical astronomy were incommensurable, but that their associated physical accounts of motion were. In order to support Copernican astronomy against "patterned resistances" resulting from "covert classifications," Galileo introduced a concept of motion in opposition to Aristotle's that was seen as refuted on basic empirical grounds. It is this notion of an alternative observation language not directly comparable with Aristotle's that becomes a node for accreting other apparently refuted theories that together could find "breathing space" to develop apart from the overadapted dominant theory. This explains why Feyerabend thought of

incommensurability as facilitating qualitative change in a dialectical fashion. While incommensurability makes initial comparison difficult, it is possible to become fluent in distinct, incommensurable approaches, as well as to modify each approach to incorporate alien notions from the other (Feyerabend 1987).

Applying the tools of recent work on cultural evolution to the competition of research programs in science allows us to see how distinct scientific communities modified the technical content of their activity piecemeal, as well as how distinct approaches and communities came to hybridize their views when their internal development allowed. In short, viewed statically at any one moment in time, science may well lack unity, but that does not mean that there is no tendency for integrated approaches to emerge as incommensurability wanes due to endogenous changes within research programs and diffusion of approaches across research communities.

References

- Allmon, Warren D. 2008. "The Structure of Gould: Happenstance, Humanism, History, and the Unity of His View of Life." Pp. 21–116 in *Stephen Jay Gould: Reflections on His View of Life*. Edited by Warren D. Allmon, Patricia Kelley and Robert Ross. Oxford: Oxford University Press.
- Barkow, Jerome H. 2006. "Introduction: Sometimes the Bus Does Wait." Pp. 3–58 in *Missing the Revolution: Darwinism for Social Scientists*. Edited by Jerome H. Barkow. Oxford: Oxford University Press.
- Barrett, Deirdre. 2010. *Supernormal Stimuli: How Primal Urges Overran Their Evolutionary Purpose*. New York: W. W. Norton.
- Bellah, Robert N. 2011. *Religion in Human Evolution: From the Paleolithic to the Axial Age*. London: Harvard University Press.
- Bloor, David. 1983. *Wittgenstein: A Social Theory of Knowledge*. New York: Columbia University Press.
- Boehm, Christopher. 1996. "Emergency Decisions, Cultural-Selection Mechanics, and Group Selection." *Current Anthropology* 37 (5): 763–793.
- Boehm, Christopher. 1999. *Hierarchy in the Forest: The Evolution of Egalitarian Behavior*. Cambridge: Harvard University Press.
- Bolger, Donald J., Charles A. Perfetti, and Walter Schneider. 2005. "Cross-Cultural Effect on the Brains Revisited: Universal Structures Plus Writing System Variation." *Human Brain Mapping* 25: 92–104.
- Bowles, Samuel. 2009. "Did Warfare among Ancestral Hunter-Gatherers Affect the Evolution of Human Social Behaviors?" *Science* 324 (5932): 1293–1298.
- Boyd, Robert, and Peter J. Richerson. 1985. *Culture and the Evolutionary Process*. Chicago: University of Chicago Press.

- Boyd, Robert, and Peter J. Richerson. 1987. "The Evolution of Ethnic Markers." *Cultural Anthropology* 2 (1): 65–79.
- Boyd, Robert, and Peter J. Richerson. 1994. "The Evolution of Norms: An Anthropological View." *Journal of Institutional and Theoretical Economics* 150 (1): 72–87.
- Boyd, Robert, and Peter J. Richerson. 2002. "Group Beneficial Norms Can Spread Rapidly in a Structured Population." *Journal of Theoretical Biology* 215 (3): 287–296.
- Boyd, Robert, Peter J. Richerson, and Joseph Henrich. 2013. "The Cultural Evolution of Technology: Facts and Theories." Pp. 119–142 in *Cultural Evolution: Society, Technology, Language, and Religion*. Edited by Peter J. Richerson and Morten H. Christiansen. Cambridge, Mass.: MIT Press.
- Burghardt, Gordon, and Kevin Laland. 2017. "Deconstructing Niche Construction: A Conversation between Gordon Burghardt and Kevin Laland" *This View of Life*, June 19, <https://evolution-institute.org/article/deconstructing-niche-construction/?source=tvol>.
- Campbell, Donald T. 1965. "Variation and Selective Retention in Sociocultural Systems." Pp. 19–49 in *Social Change in Developing Areas: A Reinterpretation of Evolutionary Theory*. Edited by Herbert R. Barringer, George I. Blanksten and Raymond W. Mack. Cambridge, Mass.: Schenkman.
- Campbell, Donald T. 1983. "The Two Distinct Routes beyond Kin Selection to Ultrasociality: Implications for the Humanities and Social Sciences." Pp. 11–41 in *The Nature of Prosocial Development: Interdisciplinary Theories and Strategies*. Edited by Diane L. Bridgeman. New York: Academic Press.
- Castile, George. 1975. "An Unethical Ethic: Self-Determination and the Anthropological Conscience." *Human Organization* 34 (1): 35–40.
- Cavalli-Sforza, L. L., and M. W. Feldman. 1981. *Cultural Transmission and Evolution: A Quantitative Approach*. Princeton: Princeton University Press.
- Chagnon, Napoleon A. 1980. "Kin-Selection Theory, Kinship, Marriage and Fitness among the Yanomamö Indians." Pp. 545–87 in *Sociobiology: Beyond Nature/Nurture?* Edited by George W. Barlow and James Silverberg. Boulder, Col.: Westview Press.
- Chudek, Maciej, and Joseph Henrich. 2011. "Culture/Gene Coevolution, Norm-Psychology and the Emergence of Human Prosociality." *Trends in Cognitive Sciences* 15 (5): 218–226.
- Cochran, Gregory, and Henry Harpending. 2009. *The 10,000 Year Explosion: How Civilization Accelerated Human Evolution*. New York: Basic Books.

- Collins, H. M. 1985. *Changing Order: Replication and Induction in Scientific Practice*. London: Sage.
- Collins, Randall. 1975. *Conflict Sociology: Toward an Explanatory Science*. New York: Academic Press.
- Dawkins, Richard. 1976. *The Selfish Gene*. Oxford: Oxford University Press.
- Dor, Daniel. 2015. *The Instruction of Imagination: Language as a Social Communication Technology*. Oxford: Oxford University Press.
- Dregger, Alice. 2015. *Galileo's Middle Finger: Heretics, Activists, and the Search for Justice in Science*. New York: Penguin Press.
- Dusek, Val. 2003. "Steve Gould: Marxist as Biologist." *Rethinking Marxism* 15: 451–465.
- Dusek, Val. 2015. "Lakatos between Marxism and the Hungarian Heuristic Tradition." *Studies in East European Thought* 67 (1–2): 61–73.
- El Mouden, C., J. B. André, O. Morin, and D. Nettle. 2014. "Cultural Transmission and the Evolution of Human Behaviour: A General Approach Based on the Price Equation." *Journal of Evolutionary Biology* 27 (2): 231–241.
- Ensminger, Jean, and Joseph Henrich, eds. 2013. *Experimenting with Social Norms*. New York: Russell Sage Foundation.
- Etter, Martin A. 1978. "Sahlins and Sociobiology." *American Ethnologist* 5 (1): 160–169.
- Feyerabend, Paul K. 1970. "Consolations for the Specialist." Pp. 197–230 in *Criticism and the Growth of Knowledge*. Edited by Alan Musgrave and Imre Lakatos. Cambridge: Cambridge University Press.
- Feyerabend, Paul K. 1976. On the Critique of Scientific Reason. Pp. 309–339 in *Method and Appraisal in the Physical Sciences: The Critical Background to Modern Science 1800–1905*. Edited by C. Howson. Cambridge: Cambridge University Press.
- Feyerabend, Paul K. 1978. *Against Method: Outline of an Anarchistic Theory of Knowledge*. London: Verso.
- Feyerabend, Paul K. 1987. "Putnam on Incommensurability." *British Journal for the Philosophy of Science* 38 (1): 75–81.
- Feyerabend, Paul K. 1995. *Killing Time: The Autobiography of Paul Feyerabend*. Chicago: University of Chicago Press.
- Flannery, Kent, and Joyce Marcus. 2012. *The Creation of Inequality: How Our Prehistoric Ancestors Set the Stage for Monarchy, Slavery, and Empire*. Cambridge: Harvard University Press.
- Fracchia, Joseph, and R. C. Lewontin. 1999. "Does Culture Evolve?" *History and Theory* 38 (4): 52–78.
- Freeman, Derek. 1983. *Margaret Mead and Samoa: The Making and Unmaking of an Anthropological Myth*. Cambridge: Harvard University Press.

- Freeman, Derek. 1999. *The Fateful Hoaxing of Margaret Mead: A Historical Analysis of Her Samoan Research*. Boulder, Colo.: Westview Press.
- Fuller, Steve. 1988. *Social Epistemology*. Bloomington: Indiana University Press.
- Gardner, A., and A. Grafen. 2009. "Capturing the Superorganism: A Formal Theory of Group Adaptation." *Journal of Evolutionary Biology* 22 (4): 659–671.
- Geary, Daniel. 2015. *Beyond Civil Rights: The Moynihan Report and Its Legacy*. Philadelphia: University of Pennsylvania Press.
- Gintis, Herbert. 2010. Review of Marshall Sahlins, *The Use and Abuse of Biology: An Anthropological Critique of Sociobiology*, [http://www.umass.edu/preferen/gintis/Sahlins on Sociobiology.docx](http://www.umass.edu/preferen/gintis/Sahlins%20on%20Sociobiology.docx).
- Gould, Stephen Jay. 1977. *Ever since Darwin: Reflections in Natural History*. New York: Norton.
- Gould, Stephen Jay. 1980. "Sociobiology and the Theory of Natural Selection." Pp. 257–269 in *Sociobiology: Beyond Nature/Nurture?* Edited by George W. Barlow and James Silverberg. Boulder, Col.: Westview Press.
- Gould, Stephen Jay. 1981. *The Mismeasure of Man*. New York: Norton.
- Gould, S. J., and R. C. Lewontin. 1979. "The Spandrels of San Marco and the Panglossian Paradigm: A Critique of the Adaptationist Programme." *Proceedings of the Royal Society of London B: Biological Sciences* 205 (1161): 581–598.
- Hacking, Ian. 1981. "Lakatos's Philosophy of Science." Pp. 128–143 in *Scientific Revolutions*. Edited by Ian Hacking. Oxford: Oxford University Press.
- Hamada, Takashi. 1991. "Biological Extinction in Terms of Overadaptation." Pp. 21–25 in *Evolution of Life: Fossils, Molecules, and Culture*. Edited by Syozo Osawa and Tasuku Honjo. Tokyo: Springer Japan.
- Hamilton, W. D. 1963. "The Evolution of Altruistic Behavior." *The American Naturalist* 97 (896): 354–356.
- Hamilton, W. D. 1964a. "The Genetical Evolution of Social Behaviour. I." *Journal of Theoretical Biology* 7 (1): 1–16.
- Hamilton, W. D. 1964b. "The Genetical Evolution of Social Behaviour. II." *Journal of Theoretical Biology* 7 (1): 17–52.
- Hamilton, W. D. 1975. "Innate Social Aptitudes of Man: An Approach from Evolutionary Genetics." Pp. 133–155 in *Biosocial Anthropology*. Edited by Robin Fox. New York: John Wiley and Sons.
- Heit, Helmut, and Eric Oberheim. 2016. "Paul Feyerabend, An Historical Philosopher of Nature." Pp. vii–xxvii in Paul Feyerabend, *Philosophy of Nature*. Cambridge: Polity.
- Henrich, Joseph. 2016. *The Secret of Our Success: How Culture Is Driving Human Evolution, Domesticating Our Species, and Making Us Smarter*. Princeton: Princeton University Press.

- Henrich, Joseph, and Robert Boyd. 2001. "Why People Punish Defectors: Weak Conformist Transmission Can Stabilize Costly Enforcement of Norms in Cooperative Dilemmas." *Journal of Theoretical Biology* 208 (1): 79–89.
- Henrich, Joseph, Robert Boyd, and Samuel Bowles, eds. 2004. *Foundations of Human Sociality: Economic Experiments and Ethnographic Evidence from Fifteen Small-Scale Societies*. Oxford: Oxford University Press.
- Holland, Maximilian. 2012. *Social Bonding and Nurture Kinship: Compatibility between Cultural and Biological Approaches*. London: CreateSpace Independent Publishing.
- Hull, David L. 1988. *Science as a Process: An Evolutionary Account of the Social and Conceptual Development of Science*. Chicago: University of Chicago Press.
- Jarvie, Ian. 2013. "The Freeman-Mead Controversy Revisited." *Philosophy of the Social Sciences* 43 (4): 531–541.
- Johnson, Thomas H. 2007. "Cultural Relativism: Interpretations of a Concept." *Anthropological Quarterly* 80 (3): 791–802.
- Jordan, Peter. 2015. *Technology as Human Social Tradition: Cultural Transmission among Hunter-Gatherers*. Oakland, Cal.: University of California Press.
- Jumonville, Neil. 2002. "The Cultural Politics of the Sociobiology Debate." *Journal of the History of Biology* 35 (3): 569–593.
- Kadvany, John. 2001. *Imre Lakatos and the Guises of Reason*. Durham, N.C.: Duke University Press.
- Knauff, Bruce M. 1991. "Violence and Sociality in Human Evolution." *Current Anthropology* 32 (4): 391–409.
- Knauff, Bruce M. 1993. "Commentary on Christopher Boehm, 'Egalitarian Behavior and Reverse Dominance Hierarchy'." *Current Anthropology* 34 (3): 243–244.
- Lakatos, Imre. 1970. "Falsification and the Methodology of Scientific Research Programs." Pp. 91–196 in *Criticism and the Growth of Knowledge*. Edited by Imre Lakatos and Alan Musgrave. Cambridge: Cambridge University Press.
- Lakoff, George. 1987. *Women, Fire, and Dangerous Things: What Categories Reveal About the Mind*. Chicago: University of Chicago Press.
- Larson, Daniel O. 2010. "Innovation, Replicative Behavior, and Evolvability: Contributions from Neuroscience and Human Decision-Making Theory." Pp. 69–80 in *Innovation in Cultural Systems: Contributions from Evolutionary Anthropology*. Edited by Michael J. O'Brien and Stephen J. Shennan. Cambridge, Mass.: MIT Press.
- Lewens, Tim. 2015. *Cultural Evolution: Conceptual Challenges*. Oxford: Oxford University Press.

- Lewontin, Richard C. 1970. "Race and Intelligence." *Bulletin of the Atomic Scientists* 26 (3): 2–8.
- Lewontin, Richard C. 1972. "The Apportionment of Human Diversity." *Evolutionary Biology* 6: 381–398.
- Lewontin, Richard C. 2010. "On Constraints and Adaptation." *Behavioral and Brain Sciences* 4 (2): 244–245.
- Li, Victor. 2001. "Marshall Sahlins and the Apotheosis of Culture." *CR: The New Centennial Review* 1 (3): 201–287.
- Lumsden, Charles J., and Edward O. Wilson. 1981. *Genes, Mind, and Culture: The Coevolutionary Process*. Cambridge: Harvard University Press.
- Lynch, William T. 2005. "The Ghost of Wittgenstein: Forms of Life, Scientific Method, and Cultural Critique." *Philosophy of the Social Sciences* 35 (2): 135–174.
- Lynch, William T. 2017. "Cultural Evolution and Social Epistemology: A Darwinian Alternative to Steve Fuller's Theodicy of Science." *Social Epistemology* 31 (2): 224–234.
- Lynch, William T. 2018. "Imre Lakatos and the Inexhaustible Atom: The Hidden Marxist Roots of History and Philosophy of Science." *Epistemology & Philosophy of Science* 55 (3): 25–34.
- Maynard Smith, J. 1964. "Group Selection and Kin Selection." *Nature* 201 (4924): 1145–1147.
- Malinowski, Bronislaw. 1922. *Argonauts of the Western Pacific: An Account of Native Enterprise and Adventure in the Archipelagoes of Melanesian New Guinea*. London: G. Routledge and Sons.
- Mathew, Sarah, Robert Boyd, and Matthijs Van Veelen. 2013. "Human Cooperation among Kin and Close Associates May Require Enforcement of Norms by Third Parties." Pp. 45–60 in *Cultural Evolution: Society, Technology, Language, and Religion*. Edited by Peter J. Richerson and Morten H. Christiansen. Cambridge, Mass.: MIT Press.
- Mead, Margaret. 1928. *Coming of Age in Samoa: A Psychological Study of Primitive Youth for Western Civilization*. New York: Blue Ribbon Books.
- Moore, Kelly. 2008. *Disrupting Science: Social Movements, American Scientists, and the Politics of the Military, 1945–1975*. Princeton: Princeton University Press.
- Moynihan, Daniel P. 1965. *The Negro Family: The Case for National Action*. Washington, D.C.: Office of Policy Planning and Research, U.S. Department of Labor.
- Nowak, Martin A. 2011. *Supercooperators: Altruism, Evolution, and Why We Need Each Other to Succeed*. New York: Free Press.
- Nowak, Martin, and Benjamin Allen. 2015. "Inclusive Fitness Theorizing Invokes Phenomena That Are Not Relevant for the Evolution of Eusociality." *PLOS Biology* 13 (4): 1–5.

- Nowak, Martin A., Corina E. Tarnita, and Edward O. Wilson. 2010. "The Evolution of Eusociality." *Nature* 466 (7310): 1057–1062.
- Oberheim, Eric. 2005. "On the Historical Origins of the Contemporary Notion of Incommensurability: Paul Feyerabend's Assault on Conceptual Conservatism." *Studies in History and Philosophy of Science Part A* 36 (2): 363–390.
- Obeyesekere, Gananath. 1992. *The Apotheosis of Captain Cook: European Mythmaking in the Pacific*. Princeton, N.J.: Princeton University Press.
- Odling-Smee, John F., Kevin N. Laland, and Marcus W. Feldman. 2003. *Niche Construction: The Neglected Process in Evolution*. Princeton: Princeton University Press.
- Pigliucci, Massimo, and Gerd Müller, eds. 2010. *Evolution: The Extended Synthesis*. Cambridge: MIT Press.
- Popper, Karl R. 1972. *Objective Knowledge: An Evolutionary Approach*. Oxford: Clarendon Press.
- Porter, Theodore M. 1996. *Trust in Numbers: The Pursuit of Objectivity in Science and Public Life*. Princeton: Princeton University Press.
- Richerson, Peter J., and Robert Boyd. 1992. "Cultural Inheritance and Evolutionary Ecology." Pp. 61–92 in *Evolutionary Ecology and Human Behavior*. Edited by Eric Alden Smith and Bruce Winterhalder. New York: Aldine de Gruyter.
- Richerson, Peter J., and Robert Boyd. 1999. "Complex Societies: The Evolutionary Origins of a Crude Superorganism." *Human Nature* 10 (3): 253–289.
- Richerson, Peter J., and Robert Boyd. 2000. "Evolution: The Darwinian Theory of Social Change." Pp. 257–282 in *Paradigms of Social Change: Modernization, Development, Transformation, Evolution*. Edited by Waltraud Schelkle, Wolf-Hagen Krauth, Martin Kohli and Georg Elwert. Frankfurt: Campus Verlag.
- Richerson, Peter J., Robert T. Boyd, and Joseph Henrich. 2003. "Cultural Evolution of Human Cooperation." Pp. 357–388 in *Genetic and Cultural Evolution of Cooperation*. Edited by Peter Hammerstein. Cambridge, Mass.: MIT Press.
- Richerson, Peter J., and Morten H. Christiansen, eds. 2013. *Cultural Evolution: Society, Technology, Language, and Religion*. Cambridge, Mass.: MIT Press.
- Sahlins, Marshall. 1976a. *Culture and Practical Reason*. Chicago: University of Chicago Press.
- Sahlins, Marshall. 1976b. *The Use and Abuse of Biology: An Anthropological Critique of Sociobiology*. Ann Arbor, Mich.: University of Michigan Press.
- Sahlins, Marshall. 1995. *How "Natives" Think: About Captain Cook, for Example*. Chicago: University of Chicago Press.

- Sahlins, Marshall. 2013. *What Kinship Is and Is Not*. Chicago: University of Chicago Press.
- Segerstråle, Ullica. 2000. *Defenders of the Truth: The Battle for Science in the Sociobiology Debate and Beyond*. Oxford: Oxford University Press.
- Shankman, Paul. 2010. *The Trashing of Margaret Mead: Anatomy of an Anthropological Controversy*. Madison, Wisc.: University of Wisconsin Press.
- Shapin, Steven. 1994. *A Social History of Truth: Civility and Science in Seventeenth-Century England*. Chicago: University of Chicago Press.
- Shapiro, Warren. 2014. "Contesting Marshall Sahlins on Kinship." *Oceania* 84 (1): 19–37.
- Smith, Adam T. 2002. "Endangered Specificities: An Interview with Marshall Sahlins, 16 October 2001." *Journal of Social Archaeology* 2 (3): 283–297.
- Sober, Elliott, and David Sloan Wilson. 1998. *Unto Others: The Evolution and Psychology of Unselfish Behavior*. Cambridge: Harvard University Press.
- Tomasello, Michael. 1999. *The Cultural Origins of Human Cognition*. Cambridge: Harvard University Press.
- Turchin, Peter. 2012. "Cultural Group Selection in Phase Transition," *Clidynamica: A Blog about the Evolution of Civilizations*, June 12. <http://peterturchin.com/clidynamica/cultural-group-selection-in-phase-transition/>.
- Turchin, Peter. 2016. *Ultrasociety: How 10,000 Years of War Made Humans the Greatest Cooperators on Earth*. Chaplin, Conn.: Beresta Books.
- Webster, Steven. 1989. "Some History of Social Theory in Sahlins' Structuralist Culture History." *Critique of Anthropology* 9 (3): 31–58.
- Wengrow, David, and David Graeber. 2015. "Farewell to the 'Childhood of Man': Ritual, Seasonality, and the Origins of Inequality." *Journal of the Royal Anthropological Institute* 21 (3): 597–619.
- West, Stuart A., Claire El Mouden, and Andy Gardner. 2011. "Sixteen Common Misconceptions About the Evolution of Cooperation in Humans." *Evolution and Human Behavior* 32 (4): 231–262.
- Wilson, David Sloan. 1990. "Species of Thought: A Comment on Evolutionary Epistemology." *Biology and Philosophy* 5: 37–62.
- Wilson, David Sloan. 1998. "Hunting, Sharing, and Multilevel Selection: The Tolerated-Theft Model Revisited." *Current Anthropology* 39 (1): 73–97.
- Wilson, David Sloan, Yasha Hartberg, Ian MacDonald, Jonathan A. Lanman, and Harvey Whitehouse. 2017. "The Nature of Religious Diversity: A Cultural Ecosystem Approach." *Religion, Brain and Behavior* 7 (2): 134–153.

- Wilson, Edward O. 1975a. "Human Decency Is Animal." *New York Times*, October 12.
- Wilson, Edward O. 1975b. *Sociobiology: The New Synthesis*. Cambridge: Belknap Press of Harvard University Press.
- Wilson, Edward O. 1978. *On Human Nature*. Cambridge: Harvard University Press.
- Wilson, Edward O. 1980. "A Consideration of the Genetic Foundation of Human Social Behavior." Pp. 295–306 in *Sociobiology: Beyond Nature/Nurture?* Edited by George W. Barlow and James Silverberg. Boulder, Col.: Westview Press.
- Wilson, Edward O. 2006. *Nature Revealed: Selected Writings, 1949–2006*. Baltimore: Johns Hopkins University Press.
- Wynne-Edwards, V. C. 1962. *Animal Dispersion in Relation to Social Behaviour*. Edinburgh: Oliver and Boyd.
- Yaworsky, William, Mark Horowitz, and Kenneth Kickham. 2015. "Gender and Politics among Anthropologists in the Units of Selection Debate." *Biological Theory* 10 (2): 145–155.