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Chapter 1

Why Anthropology Needs Biocultural Ethnography

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Abstract

Many cultural anthropologists have long been skeptical of collaboration with the other subfields of the discipline at large—in particular, biological or evolutionary anthropology—for fear of treading over long-settled ground regarding the problematic roots of anthropology in which the so-called “evolutionists” and social Darwinists promoted pseudoscience in an attempt to legitimize a range of bigoted and ethnocentric assumptions about humanity. In many anthropology departments, the entire research faculty is comprised solely of cultural anthropologists who neither think of themselves as scientists nor of their field as scientific. This is to anthropology’s detriment, as it needlessly limits not only the scope of discovery anthropologists can make, even in fieldwork, but it also reframes anthropology departments and their associated research projects within the scope of federal funding as strictly social science and humanities initiatives, putting them in

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financial and academic jeopardy. While it is certainly true that anthropology has a problematic history intertwined with pseudoscience, this does not justify a conscious initiative to rhetorically and conceptually divorce real science from cultural anthropology. In this chapter, the authors demonstrate through their own prior works across both theory and practice the tangible benefits and essential breakthroughs of approaching cultural anthropology and ethnographic fieldwork, when applicable, via biocultural frameworks that take holistic and ontological considerations of field sites, persons, and cultural modalities into account. The authors argue that by embracing the entirety of anthropology as a science, rather than shying away from this fact, the design and nuance of many more ethnographic projects—and their subsequent findings and insights about the human condition—stand to be greatly enriched.

Keywords: human ecology, sociality, biocultural, ethnography, fieldwork.

Introduction

What is anthropology? For all its far-reaching influences upon both academia and everyday discourse, the field itself remains largely underrepresented and categorically opaque in the minds of most who do not practice it. Even among anthropologists ourselves, a singular definition of exactly what it is we do in practice is not always agreed upon. As a result, even something as straightforward as whether the field of anthropology is even a science cannot find agreement across the entire body of working anthropologists. For any other field as mature, influential, and indeed, *consequential* as ours, such a bedraggled self-awareness regarding how its own practitioners understand its foundational approaches would be unthinkable. And yet, over a century since its first serious academic forms took root, anthropology retains an identity crisis regarding what type of field it actually *is*—a natural science, a social science, or a humanity?

Recently, one of the most prominent anthropological organizations, the American Anthropological Association (AAA), drafted a new attempt at an all-encompassing definition: “anthropology is the study of what makes us human” (2025). In light of accelerated sophisticated AI models, new labor culture shakeups, worldwide

pandemics, and other such crises of the current moment, it seems appropriate to refine our description of our field in this way. Anthropology is not just the study *of* humans (especially in the wake of these aforementioned and ever-growing identity crises) but rather the study of what *makes us* human. This project, also, is carried out across multiple modes and methods of inquiry. As the AAA goes on to define more clearly in the body of text under their main definition, “to understand the full sweep and complexity of cultures across human history, anthropology draws and builds upon knowledge from the social *and* biological sciences as well as the humanities *and* physical sciences” (2025, emphasis added). In other words, what makes us human is found across all possible aspects of *being* human, including how we physically evolved, how we built and interact within social groups, and how we express ourselves through everything from language to art to love to politics.

Cultural Anthropology’s Aversion to the “Science” Label

Without a doubt, one of the most contentious subjects we have found to broach with our fellow cultural anthropologists is the question of whether the methodologies we use constitute science, and by extension, whether cultural anthropologists themselves should be thought of as scientists (Peregrine et al. 2012). This is perhaps even more the case in the British and broadly European traditions of anthropology, where the distinction between social and biological anthropology has historically been seen as axiomatic. Indeed, in popular academic vernacular in the UK, sociocultural anthropology is considered synonymous with “anthropology” itself, while biological anthropology is almost always labelled as such. To wit: in the British tradition of Malinowski, if you are a social anthropologist, you are simply an anthropologist; but if you are a biological anthropologist, then you are a biological anthropologist only and are thought of as a separate sort of academic altogether who operates primarily in the field of biology, not “anthropology” as it is most regularly conceptualized.

In the American anthropology tradition established by Boas and his fellows at the turn of the 20th century, this division is far less common (though it is becoming more so in recent years). It was Boas himself who established the canon of thinking of “anthropology” as an all-encompassing field comprised of four main subdisciplines—cultural, biological, linguistic, and archaeological (Fleck 2020). Within this framing of

anthropological research, all four subfields are seen as equally vital components to the ongoing project of studying humanity in an empirical manner. Just as human beings are ourselves comprised of multiple layers of experience and expression, the field that concerns itself with studying and understanding humanity also operates on multiple planes of inquiry in order to best delineate its subject. By this same token, Boas, trained in the natural sciences, himself, set out to redefine anthropology as a fully empirical, scientific field. Even Malinowski, in his earliest writings prescribing ethnography as a refined research method for anthropologists in the field, referred to the methodology as a science (Malinowski 1922).

Why, then, has it become increasingly common for cultural anthropologists specifically to distance themselves from the “science” label and conceptually close themselves off from the other subfields of the discipline? While there are certainly some exceptions, such as integrated anthropology departments on campuses like Oxford and University College London, the British tradition of social anthropology is still seen exclusively as being the primary center of “anthropology” in the UK; in the United States and most other regions, where Boas’s four-subfield tradition originated, more research institutions now tend to organize their cultural anthropologists into their own subcultures within their anthropology departments at large, with certain cultural anthropologists and other social researchers even considering science itself as colonialist (Roy 2018). To that point, what must first be made very clear is that all of this skepticism toward and aversion from the scientific excuse for colonialist, racist, and otherwise-bigoted beliefs and practices is incredibly warranted, especially for anthropologists, seeing as how the entire field was once characterized by such actors, and this led to many problematic assumptions being made in the general populace regarding things such as the perceived biological determinism of race, intelligence, gender, and so forth that were used to reinforce oppressive public policies against the most vulnerable human communities (Bejarano et al. 2019; Fleck 2020; Lewis 1973; Liboiron 2021; Peregrine et al. 2012). Anthropology once played its own role in perpetuating these colonialist practices, and back when the field was predominantly comprised of the pseudoscientists who promoted nonsense such as social Darwinism, unilineal evolutionism, and the like, it was unquestionably part of the larger systemic problem.

Even today, there are colonialist remnants in how contemporary anthropology is carried out. Many non-white, indigenous, and other underprivileged anthropologists have correctly pointed out that there persists a Eurocentric trend in hiring practices in many mainstream academic departments, as well as highlighted how there may in fact always be an extractive quality to ethnographic fieldwork, wherein the researcher mines value for their own papers and books from the real-life daily experiences of their interlocutors (Bejarano et al. 2019; Liboiron 2021). Whether ethnography's extractive elements derive from an innate prejudice within anthropology's very DNA or are more an example of capitalistic hegemony's influence on virtually *all* professional practices, regardless of intent, is perhaps a debate best explored in a forum outside the focus of this chapter. But it is nevertheless worth noting that there is historic precedent and noble rationale behind these more skeptical and critical gazes being turned toward anthropology as a practice in the 21st century. It is arguable that any anthropologist working today who truly values the field's pro-humanity *raison d'être* would be inclined to embrace and participate in the project of decolonizing academia. Among the efforts central to this project, of course, is the decolonization of scientism.

Notice the word used, here—*scientism*, which is distinct from science, yet is often peddled as being the same thing—even, in some cases, by science popularizers and scientists themselves. This confusion is where much of the contentious attitude toward “science” as a concept within the social sciences originates, we submit. In contrast to the actual scientific process of devising hypotheses, making predictions pertaining to said hypotheses, building methods for testing those predictions, measuring the results, then continuing to build upon that knowledge as ongoing research continues to unfold, scientism assumes that “science” is in and of itself some sort of final declaration brought down from on high regarding any particular phenomenon, setting a singular interpretation of the findings in stone, never to be revised—this is not unlike religious doctrine, and ironically could not be any further from what real science actually entails (Frank 2021; Pearce 2016; Stenmark 1997). While it is not precisely the same thing as pseudoscience, scientism certainly allows for pseudoscientific claims to sit alongside real science and for the two to be philosophically considered equivalent. This is because scientism does not consider what *actually* goes into the empirical process of determining the truth claims of a

particular hypothesis; it simply labels things as either “science” or “not science,” effectively describing these two categories as indistinguishable from “fact” and “falsehood,” respectively. But this sort of categorization is incredibly teleological and reductionist, and it relies on explicitly Western ontologies of dichotomies and dualities that themselves do not have much basis in observed facts outside of Western cultural norms. Much is assumed, and little is empirically demonstrated.

It is from this fallacious thinking that we get so many needlessly reductive positions on issues such as “race,” “intelligence,” and “gender,” which are socially constructed concepts that are not themselves grounded in empirical data from any of the relevant scientific disciplines, yet are assumed—even sometimes by fellow scientists from other fields—to be empirically demonstrable. Where a small number of credentialed psychologists, as well as the vast majority of 19th century anthropologists during this era of scientific racism, unwittingly bought into scientism when it came to the truth claims about the actual existence of biological “race” distinctions, based their own models and measurements upon these incorrect postulations without actually corresponding with the genetic and biological literature on the matter, they ended up perpetuating outright pseudoscientific claims about “race” somehow corresponding to innate intelligence in humans. Another example: when zoologist Richard Dawkins claims that biological sex and human gender distinctions are the same exact thing, he is speaking outside of his own niche of expertise while also failing to cite the data gathered by the actual relevant experts in *their* respective fields. This does not make him any less of a properly credential scientist in his own field, but it does make him a victim of scientism (e.g., failing to understand the difference between biology and culture) in this instance all the same.

Beyond the examples of real scientists falling victim to this fallacious thinking, there are even more instances of non-scientists who simply peddle outright pseudoscience as if it were science itself. This would certainly describe the problematic early days of anthropology cited earlier, where the aforementioned social Darwinists and evolutionists made broad brush claims about whole groups of people, based on nothing more than existing racial and ethnocentric prejudices, and presented these claims as if they were scientific. Even the early anthropologists who strived to be empirical and rejected the evolutionists in principle still sometimes fell victim to ethnocentric assumptions about how cultures themselves behaved like singular

organisms (i.e. functionalism), or how all societies grew and evolved at more-or-less the same rate and in the same order of operations (i.e., stagism),¹ or how all kinship structures must work by default (i.e., the nuclear family), and so on. But it is imperative to note that in each and every instance we have cited here, real science was never enacted. The scientific method involves observation, recording of those observations, and continued research and attempts to corroborate and/or replicate the findings of that process. No scholar following and truly understanding this process would ever claim that their initial findings should be seen as infallible or unchallengeable, and indeed, as cultural anthropology has continued to refine itself over the past century, we have seen many of these initial assumptions become challenged, revisited, and refined (or in some cases discarded altogether). That process of our field's self-critique and revision *is* science, whether all of our fellow cultural anthropologists acknowledge it or not.

It is therefore accurate, submit the authors of this chapter, to say that while cultural anthropologists are justified in their resistance to reductionism, scientism, ethnocentrism, and evolutionism in our field, said resistance should not be extended to the very concept of science itself. Because to reject science in its entirety is to abandon one of the most powerful tools we possess for challenging precisely the forms of oppression, essentialism, and epistemic closure that cultural anthropologists seek to dismantle. Science, properly understood, is not a doctrine; it is a practice that thrives on critique, revision, and the incorporation of new perspectives. A decolonized anthropology does not fear empirical inquiry but rather demands it, insisting that our methods remain accountable to the people and realities we study. To treat science as inherently colonial is to cede the terrain of evidence to those who would misuse it. To reclaim science as a flexible, reflexive, and pluralistic mode of knowing is to strengthen our discipline's capacity to understand and advocate for human diversity in all its forms.

Cultural Anthropology: A Science Through-and-Through

As recalled in the online database *Explore Anthropology*, cultural anthropology's scientific credentials, while at times contested, still have grounding in the scientific method (2024). Like in any other science, cultural anthropologists follow structured

methodologies, develop hypotheses, and seek to identify patterns in their observations that can inform models that prove useful for understanding given phenomena (in this case, human behavior). Much of the criticism levelled at cultural anthropology that amounts to claims of it not truly being a science tends to come from the accusation that anthropological research of this sort cannot be replicated under controlled conditions (2024). The problem with this thinking is that applying such a barometer for what constitutes “real science” would also disqualify psychology, whole sub-focuses of neuroscience, and other behavioral sciences that derive their data from observation of other living organisms beyond humans. It is true that unique cultural contexts that cannot always be easily reproduced are often observed in the field, and it is also true that the human subjects of anthropological fieldwork are active participants rather than passive objects (and therefore know they are being observed, which could alter behavior), but cultural anthropology is not the only research field faced with such conditions. As already stated, any other scientific field that entails studying certain aspects of humans that require voluntary participation, such as brain scanning in neuroscience or surveys or behavioral observations in certain areas of psychology, also bring with them the same potential limitations to controlled experimentation (certain wings of behavioral psychology in particular have been in a replication crisis for some time now). But none of those factors have led to widespread claims that neuroscience is somehow “not a real science” simply because it must implement the scientific method in a way that is more malleable to its human subjects. It still operates on the same empirical principles and still goes through the same process of hypothesizing, testing, and reporting the results.

As for the claim about cultural anthropology’s inability to replicate or challenge/revise the findings of other researchers, this is also simply untrue. There have been multiple instances, already alluded to in the prior section, where this exact process has taken place. Again, this does not mean that competing theories for explaining certain phenomena cannot coexist, nor that anthropology as whole has to become overly clinical and reductive in its descriptions, but as the prior section already explained, science itself is also not so reductionist—that is an incorrect assumption. There are two landmark examples of this replication and revision process. One involves the revisiting of initial findings by the brilliant anthropologist Margaret Mead from her work in Samoa, and the other involves subsequent revisions and critiques of

methods used by Malinowski in the Trobriand Islands. In the case of Mead, her 1928 book *Coming of Age in Samoa* brought initial results that implied the average Samoan teenager did not experience the kind of psychological angst Western teenagers are assumed to be predisposed to toil under, which informed a lot of subsequent literature regarding how this might in fact be another instance of Western ethnocentric cultural norms being wrongly assumed to be ubiquitous in human nature (Mead 1928). In a subsequent research project in the same region, however, fellow anthropologist Derek Freeman pointed out that Samoan society is more nuanced in these regards than Mead's initial findings suggested and argued that the initial data gathered by Mead focused on too narrow and specifically-gendered a population sample and lasted for too short a time (nine months) to adequately provide enough data for the kind of broad-reaching implications about the society as a whole Mead argued her research found (Explore Anthropology 2024). Critics claim that this somehow proves cultural anthropology cannot possibly be scientific because the initial findings were found to be incomplete, but the reality is precisely the opposite—it took another anthropologist, revisiting the region and engaging with the initial findings, to ultimately revise the data and demonstrate the prior theory's shortcomings. Even further revisions to this framework have since been made in recent works that have pointed out the problematic aspects of Freeman's own heteronormative framing of the data. Each new iteration of the framework further refines the findings in the face of the latest data and analysis—that is exactly how science is done.

Similarly, when Malinowski's personal diary was published posthumously, it was revealed that he held private beliefs that were still very much grounded in evolutionist, racist thinking that contradicted the empirical approaches he was promoting in his academic writings from the same period and during the same fieldwork (Explore Anthropology 2024). Once again, critics of anthropology as being not a true science cite this example as if to say that the originator of ethnographic methodology's personal racism somehow demonstrates some innate non-scientific quality of the methodology itself. But this is also not an argument that holds much water when we take into account the very fact that even this critique itself acknowledges that Malinowski's ethnographic methodology contradicts his personal racist views. In other words, the method itself *does* follow scientific and empirical principles, even when the flawed human being behind the methodology was found to

often not live up to his own standards for his field. Annette Weiner's further corrections of Malinowski's theories in *Women of Value, Men of Renown* (1976) emphasize the significant role of women in Trobriand society, providing a more comprehensive understanding of the internal exchanges of female and male wealth and challenging the Eurocentric views of "primitive" life by providing a more nuanced perspective on the male *and* female social dynamics of Trobriand. Yet again, this revisiting and refinement of existing theoretical frameworks to describe observed phenomena is science. The scientific method is designed to be self-correcting over time, never beholden to any single individual's personal biases but instead grounded in empirical observation. Ethnography, when properly practiced, absolutely qualifies, as these two examples show. Faulty approaches are ultimately identified and corrected, and personal biases are found to be non-factors in the research frameworks and processes themselves. Franz Boas, too, can be found at various points in his career to be acting in contrary ways to his own empirical prescription for anthropology as a field. He measured skulls of indigenous peoples, giving undue credence to the pseudoscience of phrenology and misapplying anthropometry into debunked racialized territory, but at the same time he advocated in his writings to put an end to the idea of the "primitive" human. He also mentored women and people of color who would go on to become respected anthropologists themselves, including Mead as well as Zora Neale Hurston.

Once again, while Boas himself set a checkered example that sometimes revealed outdated and racist perspectives, his own promulgations for how anthropology should be practiced ultimately led to those very views being exposed and excised from anthropology as the field continued to refine itself and discard personal ideologies in favor of seeking the empirical realities of humanity. We can and should acknowledge the failings of these early figures in cultural anthropology, but when we cite them as examples of anthropology itself somehow being less than a science, we are lending credence to the very scientism we all claim to oppose—the idea that a field of inquiry must produce the final, most accurate data on a given phenomenon right from the start, so as to never need to be revisited or revised. And that is simply not the way science works. In short, cultural anthropology's missteps, and its subsequent identification and correction of its own missteps, demonstrates its veracity as a science, not the contrary.

Contextualizing the “Writing Culture” Revolution

In the name of decolonizing academia, certain voices within cultural anthropology have gone out of their way to argue that considering anthropology as a unified field of various subdisciplines is itself colonialist, appealing to the fact that not every spot on the globe categorizes biological and sociocultural anthropology as disciplinary counterparts (Puthra 2026). This speaks to a larger push within the subfield, attributed largely to an argument put forth by Clifford and Marcus in their work *Writing Culture* (1986), which challenged the framing of ethnographic writing as solely objective observation. Instead, Clifford and Marcus emphasized the subjective and political nature of anthropological findings, advocating for reflexivity, collaboration, and attention to the politics of field site and interlocutor representation. This has led to a broader understanding of anthropology's role in shaping knowledge and its production, as well as its relevance in contemporary social and cultural contexts. The authors of this chapter are not convinced, however, that this particular refinement to our understanding of ethnographic writing is the same thing as a call for cultural anthropologists to outright divorce themselves from scientific association. For one thing, Clifford and Marcus (1986) are arguing in favor of better context for each localized observation, informed by the testimonials and communal histories of the given field site; this is a further refined and even *more* precise gathering of data, which is every bit as scientific as their equivalent forms of contextualized data collection in the natural sciences. For another, Clifford and Marcus were dissuading ethnographers from writing about their findings as objective, universal realities, but within the context of cultural research, this is the accurate way of representing the data—“objective” is not a synonym for “scientific.” The testimonials of interlocutors and the accurate depiction of localized histories, belief systems, and genealogies are still “data” in the strong sense of the term because they depict raw findings in the field devoid of the researcher’s biased interpretations. The findings are informed by the subjectivity of the place, but that localized subjectivity is essential for data accuracy within cultural contexts. The more precise depiction of the findings in the field advocated for by Marcus and Clifford, therefore *is* scientific according to the scientific method as delineated earlier.

We therefore submit that the subsequent advocacy by some of our contemporaries to jettison biological anthropology from the field at large in the name of decolonization (Puthra 2026) is itself colonialist, albeit unwittingly so, as it misunderstands Clifford and Marcus' own revisions as being anti-empirical, and it reverts to an understanding of "anthropology" before anthropology's scientific turn, which was initially promulgated by the colonialist British anthropologists of two centuries ago who intentionally did not want their cultural writings grounded by empiricism or collaboration with the natural sciences for the express purposes of peddling racist narratives.

So, we have established that cultural anthropology in and of itself is already scientifically sound. But what if we also consider the instances in which cultural and biological anthropology intermingle as prime examples of anthropology being appropriately applied as a science? What insights might such a marriage of methodologies bring forth? How valuable to our overall understanding of the human condition might such insights be?

Biocultural Anthropology and Why It Matters

Both authors of this chapter have done prior writings on what can be thought of as *biocultural* anthropology—an interdisciplinary approach at anthropological research that implements, when applicable, methods from both evolutionary anthropology and sociocultural anthropology in the service of better delineating an observed phenomenon in human behavior. It is important to clarify that, as we have been hammering home all throughout this chapter thus far, there are a plethora of examples where an appeal to "science" and evolution when aiming to explain social behaviors can be inappropriate, misapplied, or otherwise problematic. It is also true, however, that plenty of contexts arise in the field where evolutionary and biological anthropology is absolutely appropriate to apply and does not result in the sort of structuralist, teleological pseudoscience that the worst offenders in the field's history exemplified. The aforementioned aversion to such things, once again, is understandable, but biocultural anthropology, much like biological anthropology, is not the same thing as social Darwinism and evolutionism. It takes into account the cultural contexts and differences of a given field site, does not make the mistake of

assuming the raw data itself is valuable without considering its cultural implications, and above all, it aims to enhance our understanding of the cultural side of life, not erase it.

A biocultural approach becomes especially powerful when it is used to illuminate cultural processes rather than overwrite them. One compelling example comes from Luhmann, Nusbaum, and Thisted's work on evangelical Christianity (2010), in which they combine ethnographic observation with psychological measures of "absorption"—a trait operationalized through the Tellegen scale that captures how fully individuals can become immersed in sensory or imaginative experience. Their study demonstrates that the capacity to "hear God" is not reducible to biology (e.g. the brain) alone, nor is it a purely cultural script; instead, it emerges through the interplay of culturally cultivated practices, individual psychological dispositions, and embodied sensory engagement. By pairing ethnography with empirical measurement, Luhmann, *et al.* show how biocultural methods can deepen rather than flatten our understanding of lived religious experience. The psychological data in this case do not replace the cultural analysis, and in fact go on to enrich it, revealing how cultural techniques of prayer, imagination, and attention shape the very phenomenology of worship.²

This kind of integrative work aligns closely with the neuroanthropological perspective advanced by Victoria Pitts-Taylor in her book *The Brain's Body: Neuroscience and Corporeal Politics* (2016). Pitts-Taylor argues that the brain is not a static biological organ but a socially and politically mediated site of experience that is continually shaped by cultural practices, structural inequalities, and embodied histories. Her work demonstrates that neuroscience, when approached critically, can help anthropologists trace how power, identity, and social context become literally embodied in neural pathways. Rather than treating biology as a universalizing force that erases cultural difference, Pitts-Taylor shows how biological processes themselves are contingent, plastic, and culturally inflected. This is precisely the kind of science that a decolonial anthropology can and should embrace: one that recognizes the body as a site of cultural inscription and refuses the old dichotomy between "biology" and "culture" as mutually exclusive explanatory frames. Even still, this realization is one that comes via more science, not less—good empirical practice that self-corrects and discards incomplete data and pseudoscience that often gives way to scientism.

Moreover, the integration of biological and cultural perspectives has proven essential for dismantling some of the most harmful legacies of anthropology's past. Robert Wald Sussman's *The Myth of Race: The Troubling Persistence of an Unscientific Idea* (2014) offers a clear example of how evolutionary anthropology and cultural anthropology, when brought together, can expose the ideological—not scientific—foundations of racial thinking. By tracing the historical misuse of evolutionary theory and pairing it with contemporary genetic evidence, Sussman demonstrates that race has no biological basis, and that claims to the contrary have always served political, colonial, and economic agendas. His work exemplifies how biocultural scholarship can actively advance decolonial goals: by using empirical data to challenge essentialist narratives, correct public misconceptions, and undermine the pseudoscientific rationales that once justified oppression. In this sense, biocultural anthropology is not a retreat to the problematic past but is instead a tool for confronting that past and preventing its reemergence.

Taken together, these examples (just a few of many) illustrate that biocultural anthropology, when practiced reflexively and ethically, does not collapse culture into biology or treat human variation as predetermined. Instead, it offers a framework for understanding how cultural worlds shape bodies and minds, how bodies and minds participate in cultural worlds, and how empirical methods can be mobilized in the service of a more just, accurate, and decolonial anthropology. Far from threatening the cultural richness of human life, biocultural approaches can help us appreciate its complexity, revealing the dynamic interplay between meaning, embodiment, and experience that defines what it is to be human.

Examples of Prior Biocultural Work by the Chapter's Authors

Both of this chapter's co-authors' prior biocultural work can be thought of as explorations into the whole of being human within each project's respective contexts. It was from this shared sentiment across both scholars' approaches and focuses that the interest in writing this chapter originated. To put forth our enthusiasm for this kind of work and to point to why it is important, we have decided to share relevant summaries from our prior projects that will hopefully speak even more substantively to the

diversity of ways in which the appropriate and relevant marriage of evolutionary and cultural anthropology can be applied.

The Biocultural and Cognitive Worlds of the Amazonian Shuar

The primary characteristic of a biocultural approach in anthropology is its holistic nature; this, in short, operates as a scientific pursuit where human sociocultural, cognitive and biological traits interwoven with the traits (be they material or immaterial) of other forms of life and existence are foregrounded. In other words, and as promulgated by this integrated form of anthropological inquiry, the wide variety of elements of organismic kingdoms and inorganic matter (from animals to plants and microorganisms to rocks and water bodies) embedded in Earth's ecosystems, which have been key actors in modulating human behavior and cognition throughout evolutionary history, inform the fundamentals of what makes us human. These entanglements, then, shed light on the complexity of the human condition and the relational processes underpinning it. Following this line of argumentation, a holistic understanding of anthropological research primarily implies the unification of both biological and sociocultural frameworks (see Fuentes et al. 2026); after all, if one foot of our discipline is in biology and the other in the social sciences and humanities (Keesing 1981), an intersecting point must be framed in order to fill the gap between diverse yet not antithetical forms of scientific knowledge. In an attempt to outline the basic tenets of a biocultural approach (as conceived here), we shall illustrate below the fieldwork experience by one of the authors among an Amazonian population of forager-horticulturalists.

Chapter co-author Abad Espinoza has conducted ethnographic and ethnobiological research among the Indigenous Shuar of Amazonian Ecuador. Like other Amazonian peoples (e.g., Desana: Reichel-Dolmatoff 1971; Achuar: Descola 1994), this society has traditionally lived by hunting, gathering, horticulture and fishing (Harner 1972; Karsten 2000; Stirling 1938). Yet, these subsistence adaptations have been severely eroded by a range of factors, including acculturation processes (both secular and religious), extractivist deforestation, and cash crop plantations (Abad Espinoza 2025b, 2025c). Some of these subsistence patterns and associated ecological knowledge, however, continue to be transmitted by the Shuar through social learning (mainly horticultural and botanical knowledge), while other adaptive strategies (e.g.,

hunting) survive only in the memories of elderly people. From these empirical and theoretical toolkits (consisting primarily of biophysical, mytho-cosmological and ontological realities), a biocultural approach may delineate basic and higher-order relational processes embedded in particular ethnographic experiences and general patterns of human evolution (Abad Espinoza 2025b, 2026); as such, the synchronic nature of ethnographic inquiry is thus woven into the evolutionary frame of our primate lineage and its multifarious spatio-temporal trajectories. Such an integrated framework might therefore help reconstruct (albeit in a highly speculative manner) variations, consistencies, differences and commonalities found in past and current behavioral patterns linked to our primate ancestry; the ultimate quest of biocultural anthropology is hence to provide potential evolutionary templates regarding human biological and socio-cognitive evolution without neglecting the complex interplay between basic (ecological, physiological) and high-order (semiotic, phenomenological, metaphysical) categories of being human in its whole material and abstract representation (Abad Espinoza 2025b, 2026). Delving into Shuar subsistence strategies and their various levels of engagement and conceptualization may give us instructive insights into the deep evolutionary roots of adaptive behaviors, cognitive capabilities and cultural practices that permeate human nature.

Aspects of Hunting Behavior

Even if hunting activities have been drastically reduced among the contemporary Shuar (mostly due to the factors mentioned above), some informants still acknowledge the primary importance of patterns of meat acquisition in shaping the ecological, biosocial, mytho-cosmological and ontological structure of this society. Meat, for example, operates in three interrelated levels of relationships between humans and more-than-human collectives. First, it is a major source of dietary protein and a potential source of parasitic and bacterial contamination; second, it regulates patterns of biosocial reproduction in that a good hunter (i.e., the one who provides sufficient amounts of meat) is more likely to enter into a polygynous mating system (notably, a similar behavioral pattern is found among other Amazonian peoples like the Sharanahua [Siskind 1973], Tsimane' [Gurven & von Rueden 2006] and even among chimpanzees, *Pan troglodytes* [Gomes and Boesch 2009]); third, it triggers a wide array of intimate interspecies relationalities and

sophisticated cognitive behaviors exemplified, for instance, by the ritual behaviours towards prey animals.

From these highly interconnected levels of trophic, socio-structural, and cosmological associations (Abad Espinoza 2022c), one can link specific ethnographic realities to forms of behavior and cognition shared by our fossil and closest living relatives. It is worth noting that, from an evolutionary point of view, the consumption of animal matter has been part of the trophic behavior of early hominins about three million years ago (McPherron et al. 2010; Plummer et al. 2023); this, in turn, was likely a catalyst for substantial biological and cognitive changes in our genus (Aiello and Wheeler 1995; Milton 1999; Zhang et al. 2025). Interestingly, non-human primates like chimpanzees, bonobos (*Pan paniscus*), baboons (*Papio* spp.), and capuchin monkeys (*Cebus* and *Sapajus* spp.) also exhibit complex forms of carnivory (Watts 2020; Abad Espinoza 2026); not surprisingly, it has been argued by others that the last common ancestor of chimpanzees and humans likely showed meat consumption patterns (Dominguez-Rodrigo and Pickering 2017).

Some elements of tool-assisted hunting underpinning patterns of carcass acquisition are worth mentioning here. For example, it has been reported that chimpanzees and capuchin monkeys use stick tools to hunt mammalian prey (Falótico 2023; Pruetz and Bertolani 2007); it is therefore highly likely that the earliest hominids used similar spear-like weapons made of perishable materials such as wood (Pickering and Dominguez-Rodrigo 2010). From these elementary forms of plant-tool-assisted technology, for instance, both the wooden spears made by *H. neanderthalensis* approximately 200,000 years ago (Hutson et al. 2025)³ and the spears crafted by the Shuar through the modification of the peach palm (*Bactris gasipaes*) would appear as a complexification of the components of a rudimentary techno-behaviour shared by the primate order (Abad Espinoza 2025b). These forms of embodied cognition are thus epitomized by the elementary structures of primate carnivory that further developed into complex forms of animal-human interactions (Abad Espinoza 2026).

Notions of food taboos and ritual behavior towards medium and large-sized mammals (e.g., white-lipped peccaries, *Tayassu pecari*, red brocket deer, *Mazama americana*, and tapirs, *Tapirus terrestris*) exhibited by the Shuar and other Amazonian peoples (e.g., Yukuna: Van der Hammen 1992; Juruna: Lima 1999; Nukak: Politis and Saunders 2002) are indeed superstructural mechanisms that likely evolved from

ancient relationships with animal taxa (particularly megafauna) (Abad Espinoza 2025a, 2026). Among the Shuar, these mechanisms (likely devised for the preservation of prey communities), coupled with a conceptualization of trophic dynamics beyond their material manifestation (that is, animals and plants [in this case *Bactris gasipaes* for the manufacture of spears] are endowed with agential properties) show how a complex interplay between basic and higher-order relational processes involved in hunting activities likely stemmed from elemental behavioral patterns and socio-cognitive capabilities deeply embedded in primate evolutionary pathways.

Traditional Horticulture

Like the assimilation of animal matter (protein and fat), the consumption of carbohydrate-rich tubers appears to have played a pivotal role in the evolution of our species; this, therefore, stems from the thermal and mechanical processing (i.e., the use of tools and fire) of plants with underground storage organs (USOs) by ancient hominins that likely shaped their biological, social, and cognitive systems (Ahituv et al. 2025; Larbey et al. 2019; Wrangham et al. 1999). The tool-assisted excavation of underground storage organs exhibited by chimpanzees may hence provide further empirical corroboration of the importance of this behavior in human evolution (Hernandez-Aguilar et al. 2007). In light of the above, current indigenous horticulturalists from the Amazon and Melanesia appear to have added a further layer of complexity to the elementary behavioral package (Coupaye 2021; Hugh-Jones 1979; Maizza 2017; Wiessner 2005). The Shuar, in this sense, regard swidden cultivation not only as a way of procurement of carbohydrate-rich food crops, but also as a way of engagement (both socio-materially and cognitively) with a wide variety of entities from the biophysical and immaterial world (Abad Espinoza 2025c).

This form of engagement, viewed through the prism of Shuar relational ecology, entails highly embodied forms of nurturing tubers and gardening rituals deeply entangled with concepts of gender, kinship, plant agency, and mytho-cosmological principles that shape gardening activities. Similar patterns of behavior and belief systems have also been reported among other Amazonian and Melanesian peoples (Daly 2021; Descola 1994; Hugh-Jones 1979; Sillitoe 1983; van der Hammen 1992; Wiessner 2005). The Shuar, for instance, conceive tubers (mainly manioc, *Manihot esculenta* Crantz) as more than extended things; tubers, in fact, possess attributes of

personhood and are also considered children by the women who plant, tend, and harvest them, thus highlighting the complexity and fluidity of Indigenous notions of childcare and motherhood. The rapid growth and production of tubers are of interest in this regard, primarily because they are heavily dependent on women's sophisticated cognitive skills, manifested through specific nurturing methods for cultivated plants and gardening rituals to engage with cosmic and mythical forces. Below, we will briefly illustrate this phenomenon through the lens of the ethnographic data.

One day, while walking through one of the gardens of the Tawasap community, Yasmin, a Shuar woman in her 20s, was trying to explain to co-author Abad Espinoza the use and names of the plants within it. For her, most of the trees and plants in the garden were thought of as persons (*aents*), each with a soul (*wakan*); in other words, plants are not solely material resources (e.g., food, medicine), but beings whose consciousness, behaviour, and agency faculties significantly influence the social, ritual, and cosmological structure of these Amazonian people. Moreover, according to Yasmin, gardening activities entail for a Shuar woman a profound connection with Nunkui, a mythical being and mediator of ecological and biological processes. Although the woman-Nunkui connection (e.g., Descola 1994; Harner 1972; Karsten 2000) has gradually declined over the past decades, the Shuar still conceptualize horticultural practices as deeply grounded in a cosmological and metaphysical system. This is therefore highlighted by a suite of gardening rituals—mainly those exhibited by elderly women of the communities—whose main goal is the growth and reproduction of cultigens through complex associations with Nunkui. High levels of associations between different ontological realms (i.e., terrestrial: humans, chthonic: Nunkui) are, by extension, the necessary conditions for the patterning of swidden horticulture, human-plant intimacies and agentic properties.

As a consequence, it is reasonable to conjecture that the complexity of the human-plant interface (and hence high levels of relationships saturated with bodily and multi-sensory experiences developed in the deep past) has provided tropical horticulturalists with an empirical platform for the construction of ecological niches and transmission of knowledge about plant biology, ecology, and cognition. These highly “concrete” forms (Lévi-Strauss 1966) of conceiving the behavioral and cognitive qualities of plant life may indeed complement recent Western-based scientific endeavours to understand the elements of plant intelligence (e.g., Calvo et al. 2020; van Loon 2016; see also

Abad Espinoza 2024). Tubers, in this sense, are material entities whose properties span trophic, social, and metaphysical levels of human-plant interactions (Abad Espinoza 2022c). These plant-persons (since they are regarded as children by Shuar women), therefore, play a crucial role in shaping patterns of thought and behavior. These are thus epitomised by biosocial associations (highly embodied forms of nurturing and transforming tubers into food, such as fermented manioc beer) and metaphysical and mytho-cosmological principles (higher-order relational processes involving entities beyond the physical reality) that are likely to represent the main elements of Indigenous tropical cultivation systems.

Plant-Based Medicinal Knowledge

The use of medicinal plants is likely to have played a key adaptive role in the lifeways of our hominin ancestors (Hagen et al. 2023; Hardy et al. 2012). Interestingly, among the great apes, plant-based self-medication patterns have been widely reported (Freymann et al. 2024; Laumer et al. 2024; Yinda et al. 2024), thus underscoring the deep evolutionary roots of this behavior, which, cognitively speaking, entails high levels of bodily engagement with plant matter and its associated bioactive compounds (Huffman 2001). And again, the unfolding of the “concrete” aspects (Lévi-Strauss 1966) of the vegetal world (as in the case of the bioactive properties of medicinal plants) is heavily dependent on phenomenal experiences deeply immersed in specific socio-material realities. Like extant great apes, our forebears of the deep past may have exploited the medicinal qualities of plants through a set of behavioral processes aimed primarily at the intensification of bodily interpenetration; these, specifically, likely implied enhanced forms of haptic engagement with plant materials that further stimulated a wide array of multisensory inputs.

The enactment of these processes might suggest that (1) the medicinal properties of plants were likely to have been discovered accidentally by the earliest hominids and (2) some bioactive compounds may have been either incorporated instantly via active bodily engagement with plant parts (e.g., rubbing, ingestion) or in a more gradual manner. However, the effective use of plants’ medicinal attributes was likely highly determined by the degree of association with plant life, patterns of social learning and cultural transmission and behavioral and technological innovation. A notable instance of this archaic botanical knowledge is the likely use of pharmacological plants by early

Homo to combat the high levels of pathogenic bacteria and parasites associated with increased meat consumption (Hagen et al. 2023). The cognitive and evolutionary implications of ancient patterns of medicinal plant use are thus substantial in that they likely laid the groundwork for the further complexification of herbal pharmacopoeias; these, in turn, play a prime adaptive role in modern humans living in the current Anthropocene age, embodied by the increasing degradation of ecosystems and spread of zoonotic diseases. Again, another ethnographic example derived from Shuar ethnobiology will serve as a starting point to better illustrate the sophistication and primary importance of indigenous plant-based medical systems.

Like other Amazonian pharmacopoeias (Giovannini 2015; Pedrollo et al. 2016), the Shuar utilize a wide variety of plants for different curative purposes, ranging from common physical distresses (e.g., abdominal pain or headache) to more complex forms of malaise (be it physical, psychological or spiritual) necessitating primarily ritual and shamanic intervention. The use, function and conception of medicinal and psychoactive plants, however, usually overlap and intersect; this, indeed, reveals patterns of behaviour that, from an anthropological standpoint, represent a holistic understanding of the vegetal world and its manifold biosocial and metaphysical dimensions (Abad Espinoza 2025b). For example, psychoactive plants like *Nicotiana tabacum* and *Banisteriopsis caapi*, which act as bridges linking ontological realms, also function as concrete vehicles for human physical health. Shuar ethnopharmacology, then, does not make a rigid separation between physical and spiritual well-being since consciousness and matter are highly integrated in a universe where physicalities and subjectivities (both human and non-human) are part and parcel of the same mytho-cosmological order and its relational processes.

We can observe through this ethnographic data, for instance, how often the Shuar snuffed a mix of fermented tobacco leaves and water, both as a way of socialization and as an effective treatment for nasal congestion; remarkably, the same mixture (although in some cases it is ingested rather than snuffed for a better assimilation of tobacco's psychoactive properties) is also employed in rituals involving visionary experiences (Abad Espinoza 2019). Likewise, besides inducing altered states of consciousness, *natem* (commonly known as ayahuasca), a potent decoction obtained from the mixture of *Banisteriopsis caapi* with *Diplopterys cabrerana*, is highly regarded for its emetic and purgative properties. This is consistent with recent

scientific and ethnographic evidence that highlights the critical role played by this decoction in stimulating the highly interconnected functions of the gut-brain axis (Fotiou and Gearin 2019; Politi et al. 2022).

In sum, the emetic effects induced by β -carboline alkaloids found in *Banisteriopsis caapi* (Politi et al. 2022), in combination with the hallucinogenic effects triggered primarily by N,N-Dimethyltryptamine (DMT) contained in *Diplopterys cabrerana* (Bennett 1992), make the mixture a primary trigger of biophysical processes and higher-order notions of reality (Abad Espinoza 2022c, 2025b). This, in essence, can be aligned closely with conjectures that view hallucinogenic plants as primarily selected by Amazonians for their antiparasitic properties (Rodriguez et al. 1982); not surprisingly, indeed, is the conception of *natem* as a purging sacred medicine of both biophysical (e.g., parasites) and spiritual (e.g., magic darts [tsentsak]) agents (see, e.g., Jernigan 2011 and Shepard 2004 for similar conceptualizations of psychoactive plants by other Amazonian societies). Against this socio-material and conceptual backdrop, the properties of the plant kingdom transcend the utilitarian and symbolic nature embodied by the sphere of extension; plants are, accordingly, both good to eat/assimilate and think and even more than that, depending on the level and quality of relations humans established with them to further unfold the otherwise concealed attributes of plant matter.

On the basis of the aforementioned considerations, and because plants have played a pivotal role in modelling Shuar (health) belief systems, it might be reasonable to ask: are plants still playing such a critical role in Shuar well-being even in the midst of increasing socio-economic inequalities, environmental degradation and spread of zoonotic diseases, primary outcomes of the current Anthropocene era and capitalist mode of production? If so, what, then, are the specific behavioral modalities and the degree of interspecies relationalities involved in current patterns of herbal medication? The answers to these questions may well emerge from botanical wisdom deployed by the Shuar to manage the outbreak of COVID-19 in their communities. This culturally transmitted knowledge of plant life, therefore, has proved essential during pandemic times since it has provided these people with critical sources of carbohydrates (tubers) and medicinal plants to cope with the increasingly precarious economic and health system (Abad Espinoza 2022b, 2024, 2025a, 2025b, 2025c). A case in point is how the Shuar have modified, mixed, and ultimately assimilated plants' bioactive compounds

to combat the respiratory infections caused by COVID-19; this, in a nutshell, underscores the high levels of bodily engagement and sophisticated cognitive skills exhibited by this society in relating, transforming, and incorporating essential elements of the plant kingdom.

Drawing on digital and in-person ethnographic inquiries, this chapter's co-author Abad Espinoza was able to record several instances of medicinal plant use among the Shuar to treat coronavirus disease. The Shuar, for example, prepared an infusion by mixing various plant parts from different taxa (e.g., *Maytenus laevis* Reiss, *Conocarpus erectus*, *Uncaria tomentosa*, *Zingiber officinale*) with sugar cane alcohol (aguardiente) (Abad Espinoza 2022b, 2025b). The concoction, then, not only functions as an effective treatment for COVID-19, but also shows the sophisticated ingenuity of this Amazonian society. Notably, the complexity and adaptiveness of Shuar techno-behavior, typified by the mindful extraction of phytochemicals, are further substantiated by studies indicating the antiviral and anti-inflammatory effects of the plants used in the infusion (e.g., Ascate-Pasos et al. 2022; Azevedo, et al. 2018; San Chang et al. 2013). In brief, this medicinal plant knowledge, like that exhibited by other Amazonians during pandemic times (Del Aguila Villacorta et al. 2021; Oikonomakis 2020; Shepard and Daly 2023) likely hints at adaptive behaviors also shared by our extinct and extant phylogenetic relatives (Hagen et al. 2023; Hardy et al. 2012; Freymann et al. 2024, Laumer et al. 2024; Yinda et al. 2024); nevertheless, the herbal pharmacopoeias displayed by modern hunter-gatherers and horticulturalists are to be understood as heightened forms of associations with plant materials, which, from an evolutionary viewpoint, have provided an adaptive advantage to our species in the face of changing environmental conditions.

A Biocultural Methodology to the Study of Human Learning and “Edge Rituals” in Times of Insecurity

Chapter co-author Fleck has applied his biocultural understanding and methodologies to a number of different ventures, but one common focus of his that has continued to return across his scholarship (and one that continues to benefit from the biocultural framing through which it is explored) is how empathy evolved within and continues to interact across humanity. While a separate chapter in this same volume more fully

explores this particular avenue of inquiry for Fleck, for our purposes here we can summarize briefly a particular project that utilized a biocultural approach in the context of understanding empathy as a cognitive process for social learning.

First, it must be clearly stated that (taking heed of the points regarding scientism from earlier in this chapter) Fleck's approach to combining evolutionary and cultural anthropology is not reductionist, nor would it be fair to call this author a "functionalist." Fleck explicitly rejects functionalist perspectives (Fleck 2025a, 2025b), emphasizing that empathy cannot be reduced to a single purpose, such as species propagation or survival. Instead, he argues for a nuanced understanding of empathy that incorporates both its evolutionary origins and its broader cultural, social, and abstract manifestations. Fleck advocates for a multidisciplinary approach, combining insights from natural and social sciences, which goes beyond the reductive explanations typical of functionalism (which is, after all, a long-debunked and rejected relic of anthropology's teleological past).

In a paper based on his thesis work from his first master's degree (a degree focused on neuroscience and human development), Fleck (2021) proposed a research framework linking our current understanding of the evolutionary process of multi-level selection to empathetic, community-driven pedagogy in elementary classrooms, emphasizing social-emotional learning (SEL) grounded in anthropological and psychological data. *Group selection theory*, once dismissed in favor of its rival framework *kin selection theory*, has over decades contributed more to our nuanced understanding of how natural selection unfolds within the more layered observations that take both human groups and individuals into account (Fleck 2022: 42–3). The resulting revised framework, *multi-level selection theory*, was most famously championed by evolutionary anthropologist David Sloan Wilson and is now widely supported as a key explanation for human empathetic group behaviors beneficial for species propagation (Fleck 2025c: 38–44). For more detail on the specifics of what this theoretical framework involves, consult Fleck's other chapter in this very volume, which contains a portion wholly dedicated to unpacking the subject.

In their work titled *Multilevel Selection Theory and Major Evolutionary Transitions: Implications for Psychological Science*, Wilson, along with his colleagues Mark Van Vugt and Rick O'Gorman (2008), discussed multi-level selection theory, major evolutionary transitions, and their implications for psychological science,

including group behavior, cognition, morality, and culture. In summary, the paper articulated that natural selection operates at multiple levels of biological hierarchy, that groups become higher-level organisms when “between-group selection” dominates within-group selection, that major transitions include the evolution of eukaryotic cells, multicellularity, social insect colonies, *and* human groups, and that human evolution likely represents one of these major transition, turning groups into superorganisms with significant ecological dominance. Among the implications drawn from their data for the cognitive sciences, Wilson and colleagues found that group cognition involves social interactions, with evidence that groups outperform individuals on complex tasks, and that group-level adaptations require mechanisms to suppress internal conflict, similar to social control in multicellular organisms—with traits such as morality and cooperation evolving likely to serve as said mechanisms and maintain group cohesion—and therefore, species propagation.

Fleck’s work has been part of the subsequent ongoing anthropological project which Wilson has also been involved in—along with others, including perhaps most notably Lee Cronk (1999) and Elliot Sober (2026)—to further demonstrate that empathy is also one of these same traits that evolved for group cohesion purposes—at least initially, before subsequently evolving into something much more fundamental to our cultural registers and daily ontologies (Fleck 2025a). This framework for a proposed applied study to elementary classroom settings was built upon the proposition that the classroom be conceptualized and laid out as a micro-community where multi-level selection principles can promote empathy, cooperation, and mutual benefit. Elementary age classrooms were chosen as the ideal setting because of the latest empirical studies (Gerdemann et al. 2020; Gonzolez et al. 2020) indicating that children as young as 4 to 9 years develop social-emotional understanding, including concepts of fairness and equity. This made early elementary pedagogy a critical focus for Fleck’s proposed study. Children’s understanding of social emotions and fairness solidifies on average around age 6 (Kalra 2026), and they respond positively to social-emotional practices. Effective pedagogical strategies within such a framework, therefore, would likely include fostering direct connections among students and between students and teachers, promoting trust, community, and shared relevance, which enhance engagement and retention.

When Fleck revisited this framework proposal and actually built the study, he corroborated much of his initial hypothesis (Fleck 2025b). Examples from observed classroom practices demonstrated that involving students in advocacy and community-building activities increased trust, engagement, and learning retention. The primary aim of the study was to explore how combined anthropological and cognitive science insights into group empathy could inform and improve pedagogical practices. The research did not seek to create specific curricula but to develop an empirically grounded rationale for organizing classrooms as community-like groups. The research questions that were posed were (1) whether teachers with a kin-selective worldview are more receptive to SEL, (2) whether classrooms organized as social communities improve morale and relationships, and (3) whether such organization enhances material retention over a school year (in other words, the final study structure was longitudinal, and the methodologies included surveys, comparative studies between traditional and restructured classrooms, and longitudinal assessments of retention and social cohesion over the course of that aforementioned academic year). The finding's implications for broader impact included the fact that grounding classroom practices in multi-level selection theory and social-emotional principles are shown to counteract resistance to SEL (which faces some ideological pushback) (Blad 2020). And this contributed in its initial findings to the likelihood that the evolutionary basis of empathy and cooperation supports the argument for SEL as being an extension of a natural, beneficial human trait. Applying these insights to classrooms, argued Fleck in this particular avenue of his writing, aims to foster equitable, inclusive educational environments where *all* students are encouraged to develop mutual aid, shared relevance, and emotional well-being, and the ongoing research Fleck does on this front of anthropological inquiry advocates for shifting from traditional, individualistic education models toward community-oriented, empathetic pedagogies rooted in empirical, evolutionary science (Fleck 2021, 2025b).

A Broader Application

This trajectory of anthropological inquiry from Fleck demonstrates the benefit of biocultural anthropology by effectively merging insights from both social and natural sciences to address a practical issue: enhancing classroom pedagogy through empathy and community-driven practices. Integration of anthropological and psychological

research worked for a specific purpose in this context, as the research in question combined anthropological theories, such as multi-level selection, with psychological studies on child development, equity, and empathy. This interdisciplinary approach highlights how evolutionary principles of group cooperation and altruism can inform social-emotional learning (SEL) practices in classrooms, but there are implications to be found in this work for successful application of evolutionary biology to social contexts in even broader, more ontological strokes. The discussion of multi-level selection theory illustrates how evolutionary advantages of altruistic group behavior can be applied to a potential multitude of human social structures, not just elementary school classrooms, and this connection bridges the gap between biological evolution and cultural practices, showing how innate human tendencies for empathy and cooperation can be leveraged to improve social and communal outcomes (Fleck 2026: 132–9). By synthesizing knowledge from anthropology, neuroscience, and studies on how human brains acquire and retain information, this area of Fleck’s research showcases how biocultural anthropology can provide a comprehensive framework for understanding and improving human behavior and social systems beyond just his particular study’s parameters.

“Edge Rituals” in Times of Material Insecurity and their Neuroanthropological Connections

Another of Fleck’s case studies to look at how human multi-level selection and congregation through empathy has manifested culturally was about displaced youth in post-conflict Colombia—specifically, a community that was formed in a transitional housing zone near Bogotá. Fleck examined how these young people, many of whom were former child soldiers or victims of paramilitary violence (Downing 2014), developed a unique form of spiritual expression in the aftermath of trauma (Martuscelli and Villa 2024). These community members had experienced extreme violence, displacement, and loss of family, and localized religious institutions were met with an anti-political brand of distrust (Ferguson 1994). There, an emergent spirituality of sorts was observed, with a rise of “edge rituals” (e.g., informal gatherings involving storytelling, music, and other such symbolic acts of healing). These rituals blended what had once been a colonial remnant of Catholic imagery with indigenous cosmologies and personal mythologies.

While this sort of syncretism has historically been done on behalf of indigenous peoples out of active colonial pressure (Catholicus 2024; Torico 2026), how it was observed in this case, in a post-colonial context, bore the earmarks of something more empowering and transformative—more of a parrhesiastic practice (Frey 2024). The participants' practice embodied survival and transformation of aporic suffering and displacement—something Fleck has argued elsewhere is characteristic of *aporial* moments of cultural flux where participants occupy a space of contradiction (Fleck 2025c); in this case, neither fully secular nor religious, neither complete victims nor freedom agents, but somehow occupying all and none of these positionalities within a close proximity of time. This ambiguity fostered creative spiritual synthesis and parrhesiastic transcendence of their present material insecure conditions.

This too can be better understood and contextualized on the biocultural front as yet another interaction between the natural procilivites of humans within group contexts and their conscious social constructions to best realize those needs within specific cultural moments. Fleck has written elsewhere, in a neuroanthropological framing (Lende and Downey 2012), about *niche construction* and how it is the process by which humans actively modify the functional relationship between themselves and their environment by changing one of the factors within that environment (Fleck 2025a)—this also demonstrates how a purely functionalist interpretation of evolutionary influence on human behaviors and cultures falls flat, because humans actively fight that pure functionalism even within our own group practices. This concept highlights how socio-biological ecologies of human populations are shaped by social behavior, which is, in turn, influenced by the pressures of those same environments. Nothing we anthropologists observe in the field is ever solely nature or nurture, but a symbiotic entanglement of both. And sometimes, within the proper contexts and based on the goals of the ethnographic fieldwork at hand, a biocultural approach to carrying out such research is the only truly honest way to gather the most holistic and representative data.

Material Insecurity Research and Its Implications for Medical Anthropology

Fleck has also applied his biocultural approach to the subdiscipline of medical anthropology in the past (Fleck 2025c: 157). One particular study he did in that tradition, which he conducted alongside medical anthropologist Lisa Henry and others

(2023), looked at the aforementioned conditions of material insecurity as it pertained to food insecurity among LGBTQIA+ college students in North Texas, highlighting their unique experiences, understanding those experiences through a broader, biocultural and medical context, and subsequently recommending inclusive systemic solutions (this was also an applied anthropologist project that partered with a client and had the goal of producing data that could be used for practical purposes).

The “edge rituals” of this community of students amounted to gatherings for the purposes of obtaining free food at local community centers, churches, and campus events. These efforts found a bolstered rate of success when they were reimagine by the students themselves as social events that built a sense of community and belonging along these similar common experiences of food insecurity. These were framed more broadly as coping strategies, but edge rituals they certainly qualify as under Fleck’s previously-cited definition.

This data also took a biocultural approach to better contextualize food insecurity of this kind as something that also has effects on the mental well-being and physical health of the students in question, which also helps in the broader project of finding practical application and visible meaning for the resiltis of anthropological research. In short: why does any of this research matter? Why should people care about anthropological research? What tangible, material benefits for everyday people does it reap? Well, in cases such as this study, a real problem was identified (Texas college students have a food insecurity rate of 43 percent, higher than the national average), a clear demographic of student was revealed to be suffering the most from such conditions (41 percent of the students of focus lost family support due to holding an LGBTQIA+ identity; these LGBTQIA+ students experienced higher levels of food insecurity and related gaps in support; family rejection and lack of support exacerbate food insecurity and emotional distress and mental health woes for these students), and then real-world solutions were proposed at the study’s end (including more officiated events by the schools themselves that mimicked the events already organized by the students themselves, along with advertising to make the events more widely known and accessible), demonstrating how work of this sort not only reveals new details about ongoing crises but also aims to propose wats forward that will benefit our fellow humans in distress. The biocultural nature of focusing not just on these material conditions, but the medical, emotional, and mental state shanges as a result,

contributed to this study proving so impactful. And indeed, other anthropologists have since cited and built upon this study in various prestigious and wide-reaching publications, such as the University of Cambridge-published journal *Public Health Nutrition* (Scutts, *et al.* 2025), as well as several others (Allocca et al. 2025; Buchman, Larrañaga, and Jabson Tree 2025; Zottarelli et al. 2024), ensuring that this research would go on to have tangible impact in the worlds of social policy and medical research, even if only in its own small way.

Conclusion

We impress upon the reader that the biocultural approach to anthropological inquiry is not only methodologically sound but also at times invaluable and necessary for certain ethnographic work to holistically and accurately gather and relay the field data. We also make note of the fact that, as has been demonstrated in this chapter, much of this biocultural work can lead to deeper understandings on both the cultural and evolutionary sides of anthropology, as well as applied research projects that see tangible, real-world benefits for real, everyday people existing outside our academic periphery.

As the scientific community at large proposes the concept of the *Anthropocene* and strives to bring the most relevant fields to the table in order to properly understand and navigate it, many anthropologists, across the subfields, have set out to do relevant and hard-hitting research meant to contribute to that project via what is often referred to as an anthropology beyond the human. To do such work, plenty of other scientific fields have been consulted and collaborated with, including climatology, botany, ecology, geology, meteorology, biology, zoology, and so many more. And yet, each of these projects remains unmistakably anthropological in its own right, serving both the larger scientific purpose of exploring and delineating their corner of the Anthropocene study as well as important advancement of ongoing anthropological conversations (Abram 1996; Kimmerer 2020; Kohn 2013; Lende and Downey 2012; McCorriston and Field 2020; Stanish 2017; Tomasello 2016; Tsing 2015, Ziegler Remme and Sillander 2017; Vovlas 2021, etc.). All of these works matter—not just to anthropologists, and not just to overly academic conversations that merely bounce around within our removed, esoteric bubbles, but to the real world.

This work is important. This work is topical. This work is invaluable to the betterment of our collective understanding of ourselves and the world around us—just like any other science.

These facts show that anthropology, at its most rigorous and multidisciplinary, is absolutely a scientific field, and one that deserves to be publicly recognized as such—after all, with such recognition comes the same prioritization for certain wells of funding, research grants, departmental health within academic institutions, and a plethora of other benefits that anthropology at large is currently being unjustly starved of. In a time when the social sciences and humanities are being maliciously defunded (Blackburn and Serfaty 2025), and as a result, longstanding anthropological publications are being shuttered (Rutherford 2025) and whole anthropology departments and programs at universities are significantly shrinking (Andreatta and Brondo 2025; Khalvashi 2026), anthropologists across the entire field have the opportunity to stand in solidarity, regardless of subfield, and promote this invaluable discipline as the scientific, empirical, and practically applicable world of inquiry that it truly is.

When anthropology departments are defunded, scaled down, or outright closed due to “anti-woke” policy, compounded with neoliberal financial rationale, that toxic narrative is only further emboldened due to the entire field of anthropology being seen in the public eye as solely a social science or humanities field (and therefore, in the minds of many with their fingers on the dial, not of any use to the applied world). This destruction of research institutions and departments occurs indiscriminately across *all* anthropology departments—even those that are predominantly populated by biological anthropologists or archaeologists, who are undeniably doing “science” in the sense that most would consider practical, applicable, and beneficial to the real world. And this identity of anthropology *at large* as not being a science at all is largely propagated by anthropologists themselves; cultural anthropologists who do not see themselves as scientists (or in some cases do not even see science itself as anything other than problematic and counterintuitive to the work they do). It is the hope of this chapter’s authors that we have made a compelling case for why this perspective is both self-destructive and factually incorrect. Anthropology, perhaps moreso than any other scholarly discipline, needs to survive if modern humanity wishes to thrive well into this new century and beyond.

It is through the unique insights that only the multidisciplinary nature of anthropological inquiry can bring to the table that some of the most important, human-focused issues can be adequately and holistically researched, understood, and utilized for the overall betterment of human well-being and progress for social unity. The project of getting the rest of the world to understand that fact begins with us anthropologists collectively understanding it for ourselves. From there, we can articulate the nuance and the importance of what we do—even, and perhaps especially, in the realm of empirical scientific inquiry and applied practical results for the benefit of mankind. Yes, anthropology will always, in certain circumstances, need biocultural ethnography to paint complete pictures and derive the most enriched data, but it is just as true that modern humanity at large will always need anthropology. The time for everyone in this field to recognize the equal validity of each other's subfields and stop casually *othering* each other is long overdue. We have now reached a sociopolitical moment, however, where it is imperative.

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¹ By “stagism,” we do not refer explicitly to the Marxist-Leninist ideology of “Two-Stage Theory,” which argues that all civilizations must suffer through capital-forced production structures before they can progress to socialism—although that is also sometimes called “stagism” in political science literature. Instead, we refer to the broader terminology used to describe any dogmatic and reductive belief in a linear form of cultural progression.

² There are further cognitive evolutionary theories of religiosity as a human phenomenon, two of the most prominent being postulated by Boyer (2001) and Atran (2019), respectively, though it is our position that Boyer’s approach is far too teleological and reductive, while Atran’s understanding of religiosity as an advantageous mutation in the human brain for allowance of imagination for cultivation of empathy for group congregation and survival is much more viable in light of the most recent data regarding human group empathy and natural selection.

³ Although it is worth keeping in mind that stone tools like Oldowan existed between those times, and there are no signs of composite tools (e.g. stone blades mounted on wooden shafts) until much later.