

## RESEARCH ARTICLE

## "Human Nature" and the Biology of Everyday Life

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**ABSTRACT** Anthropologists are well poised to contribute to an immanent theory of human physiological experiences that accounts for the broad social and environmental influences that shape individual and community experiences of health and disease. This article forwards a theory of "the biology of everyday life" as a means to conceptualize the interactions between institutional expectations of behavior, cultural norms, and biological plasticity. Drawing on a wide variety of research on human sleep, this article shows how the expression of sleep needs vary within and between societies and are shaped primarily not by innate biological drives but cultural norms embedded in the institutions that comprise the infrastructure of everyday life. Embracing perspectives from laboratory scientists, social theorists, and ethnographers, the biology of everyday life offers a way to conceptualize human nature not as a set of drives but a supple interaction of physiological plasticity, cultural expectations, and social organization. [*plasticity, social determinants of disease, epigenetics, sleep*]

**RESUMEN** Los antropólogos están bien posicionados para contribuir a una inmanente teoría de la fisiología humana que tiene en cuenta las amplias influencias sociales y ambientales que modelan las experiencias individuales y comunitarias de salud y enfermedad. Este artículo avanza una teoría de la biología de la vida cotidiana como un medio de conceptualizar las interacciones entre expectativas institucionales de comportamiento, normas culturales, y plasticidad biológica. Basado en una amplia variedad de investigaciones sobre el sueño humano, este artículo muestra cómo la expresión del sueño necesita variar dentro y entre sociedades y está modelado primariamente no por impulsos biológicos innatos sino por normas culturales embebidas en las instituciones que comprenden la infraestructura de la vida cotidiana. Acogiendo perspectivas de científicos de laboratorio, teóricos sociales, y etnógrafos, la biología de la cotidianidad ofrece una manera de conceptualizar la naturaleza humana no como un juego de impulsos sino como una interacción flexible de plasticidad fisiológica, expectativas culturales, y organización social. [*plasticidad, sueño, biología local, capitalismo industrial, biología como ideología*]

### FROM BODY TECHNIQUES TO BIOLOGY AS IDEOLOGY

In 1935, Marcel Mauss proposed a rubric for anthropology, "The Notion of Body Techniques" (1979), in which he suggested that anthropologists focus on basic biological processes and how they differ in their expression between societies and over time as a means to understand how "culture" shapes human physiology. For Mauss, how people go about conducting themselves in the world, whether it be

walking, eating with or without utensils, using their left or right hand, sleeping, engaging in sexual behaviors, and so on, indexes cultural beliefs but also materially shapes the body and the world of which the body is a part, obvious in the ways that compartment shape the body. More recently, Margaret Lock's work on "local biologies" (Lock 1993; Lock and Kaufert 2001) highlights how the body is materially divergent across societies based upon how biological processes like menopause are conceptualized, as Japanese

women experience their bodies quite differently from women in the United States and Canada—and, through epigenetics, their bodies come to be different based on environmental influences, including the prevalence of phytoestrogens in their diet. In a very different context, Paul Riesman (1992) demonstrated how differential access to foodstuffs based on a history of inequities between the FulBe and RiimaayBe in West Africa led to differing values associated with the sensations of the digestive process and defecation, which in turn reinforced ideas about diet, health, and community. In contemporary Japan, daily experiences of exhaustion have normalized sleeping in public for students, workers, and politicians, simultaneously reinforcing expectations of work and school demands and the physiological experiences they produce, like exhaustion (Steger 2003).

How bodies come to be shaped in these ways is indebted to forms of preference and taboo (Douglas 2002), which can lead to the medicalization of disorderly experiences of the body (Conrad 2007) and propel and stifle scientific research. The nexus of human physiological experiences, material worlds of inhabitation, scientific and medical practice, custom and tradition, consumer markets, and taboo create *the biology of everyday life*: the ways that conceptions of “normal” everyday life become reified as the “natural” basis of human physiological experiences in the domain of “biology” as an ideological function of industrial capitalism in the nineteenth century and its lingering influences in the present.

In proposing the biology of everyday life as a rubric for anthropological analysis, I seek to provide a complementary project to biocultural approaches in contemporary anthropology (Dressler 2005; Goodman and Leatherman 1998; Sobo 2011; Wiley and Cullin 2016). Although varied in their approaches, many biocultural anthropologists tend to privilege laboratory-based scientific findings either in their own research or as comparative data for their findings. In doing so, one risk is that unmarked social biases are reproduced in scientific practice (Wolf-Meyer 2016), but critical attention to laboratory practices and scientific knowledge help to overcome these ideological oversights (Goodman, Heath, and Lindee 2003). Taking impetus from the anthropology of science, which has argued for treating scientific knowledge production as imbricated in the same forms of culture-bound rationalities as other forms of knowledge production (S. Franklin 1995; Helmreich 2009; Martin 1997; Montoya 2011; K.-S. Taussig 2009), the biology of everyday life seeks to position scientific knowledge symmetrically with other forms of knowing bodies and the worlds they inhabit (Barnes 1974; Latour 1987). This is not to discount science but instead to treat it ethnographically and to understand scientific claims as existing within systems of meaning making that can be biased in racist, sexist, classist, and ableist ways that are invisible to its practitioners and consumers (Jones 1993; Kahn 2004; Martin 1992; Roberts 2011).

The biology of everyday life seeks to situate scientific knowledge production alongside cultural expectations of behavior and nature in such a way as to understand the feedback between science and everyday life that produces expert claims to objective knowledge (Haraway 1991; Harding 1986), which can be translated into medical and pseudo-medical practices and lay the basis for claims about “human nature” in and beyond the social sciences (Fuentes et al. 2010). This feedback can perpetuate systemic biases and institutional forms of discrimination and medicalization that become reified as existing in “biology” rather than acknowledge the social organization that produces specific physiological experiences (Kaufman and Hall 2003; Montoya 2007; Oudshoorn 1994; M. Taussig 1980). The biology of everyday life provides a framework to draw on trends in cultural anthropology to conceptualize how human physiological experiences are made material through the diverse systems of knowledge production and practice that comprise the hypermediatized sociotechnical environment that modern humans live within (Briggs and Nichter 2009; D. Porter 1999; Scheper-Hughes and Lock 1987).

In the following, I draw on a long-standing research project on human sleep, which is ethnographic, archival, cross-cultural, and centered in the United States. This project covers the period from the 1840s through the early 2000s and demonstrates how dominant social and scientific ideas about sleep—when and how humans sleep, and what counts as pathological—were indebted to the workplace demands of emergent industrial capitalism (Wolf-Meyer 2012). This research has included attention to historical discourses about the naturalness of human sleep, the production and dissemination of medical knowledge in clinical contexts, the implicit racialization inherent in American medicine, and patient accounts of sleep disorders and their impacts on everyday life. Across this research, my focus has largely been on the history of scientific and medical traditions and their current practice, as well as the ways that individual experiences and subjectivities are shaped through expert knowledge and action. Here, I focus primarily on archival and textual sources, draw brief examples from my own research, and point to ethnological comparisons to show variations in experiences of the everyday and their consequences for human behavior and health as based in “human nature,” often reified as based in some fundamental “biology” either unique to humans or shared with a primate ancestor (e.g., Pinker 2003). Rather than this view of an unchanging, primordial human nature, I follow contemporary biological anthropologists who argue that human evolution is a continuing process (see Marks in Fuentes et al. 2010; Marks 2002) that is shaped not only by natural selection but also, and increasingly, by the anthropogenic contexts of contemporary human life (cf. Laland, Odling-Smee, and Feldman 2000). Human nature changes as a function of everyday life and is stabilized as an artifact of scientific and popular ideologies that seek explanations through unchanging, immutable biological drives.

## EVERYDAY LIFE AND THE NATURE OF HUMAN NATURE

One of the most profound shapers of human plasticity in the history of human life was industrial capitalism, which found its power in the institutionalization of cultural norms, particularly the management of time and space (Foucault 1995; Le Goff 1982; Rabinbach 1990; Schivelbusch 1986; Thompson 1980; Weber 1976), and built upon the already impactful development of colonial plantations and their regimentations of human bodies (Mintz 1985). For many laborers in the North Atlantic, particularly in the United States and Western Europe, work moved from the context of rural agricultural spaces to urban spaces and the factories they housed. This required workers to adjust to highly regimented workdays that depended upon the use of sunlight to illuminate factory floors before the invention of electric light (Schivelbusch 1995)—workdays that initially extended from dawn to dusk until social movements enshrined shorter workdays as a norm (Roediger and Foner 1989). Alongside these developments in labor practices and working populations, natural philosophers slowly became biologists, and physicians became increasingly reliant upon scientific evidence in the diagnosis and treatment of disease (Daston and Galison 2007; R. Porter 1999). Yet scientific and medical practices were influenced by the same cultural expectations of human behavior as held by employers and workers, leading to the creation of scientific and medical foundations that were at odds with human physiological potentials. This was the case with sleep, in which emergent norms around consolidated sleep led physicians to argue against biphasic sleep (Wolf-Meyer 2011),<sup>1</sup> as well as bodily comportment in the workplace (Martin 1992; Rabinbach 1990), racialized understandings of intelligence (Gould 1996), and attitudes toward disability (Ordovery 2003). In each case, scientific ideologies (Canguilhem 1990) shaped understandings of human biology in profound, and sometimes damaging, ways.

In the case of human sleep patterns, this has meant that ideas about the naturalness of consolidated sleep—roughly eight hours of continuous sleep during the night, without a nap during the day—took hold in the nineteenth century with little to no evidence, and often with evidence to the contrary (Ekirch 2001; Reiss 2017; Wolf-Meyer 2011). In support of popularizing the naturalness of consolidated sleep, physicians, scientists, employers, and politicians argued against the sins of biphasic sleep. By the turn of the twentieth century, consolidated sleep was accepted as normal to the degree that experiments to determine its naturalness were largely abandoned (Kroker 2007). When non-consolidated sleep appeared in laboratory settings, it was largely as an accident, as in Thomas Wehr’s (1992, 1999) experiments regarding seasonal affective disorder, which established that with limited sunlight and no electric light, human sleep can become biphasic, with sleep onset for individuals occurring near sunset, followed by a period of wakefulness in the night, then a second period of sleep until morning. But each of his subjects still worked a typical

workday, reporting to the lab for a night’s sleep, thereby upholding everyday expectations of normal sleep. Similarly, in the twentieth century, very little social science was conducted on cross-cultural sleep patterns, with most anthropologists barely noting its existence, let alone variations. Why sleep has recently emerged as an object of study for social scientists (Brunt and Steger 2008; Ekirch 2001; Kroker 2007; Williams 2005), biologists (Knutson 2014; Nunn et al. 2010; Yetish et al. 2015), and humanities scholars (M. Brown 2004; Greene 2008; Reiss 2017) is unclear; however, it may be as a result of the intense biomedical focus on sleep in the late 1990s that emerged from the popularization of a series of new sleep-related drugs and the increased attention to sleep disorders like insomnia and sleep apnea (e.g., NSF 2002).<sup>2</sup> Sleep has become profitable for academics as well as physicians and pharmaceutical companies.

If sleep science had emerged from outside of the North Atlantic in a society where midday naps were the norm, or where individuals and families routinely stayed up late into the night, the basic understanding of circadian rhythms and the arrangement of sleep would be different. Moreover, the sleeping arrangements of family members might be different (Tomori 2016). In sleep science and medicine, what was normalized as a result of the industrial management of labor became understood as “natural” (Davis 1995), thereby concretizing relationships between workers and employers, patients and physicians, and scientists and their objects of study. This recursive relationship among cultural norms, social expectations, and scientific objects is the basis for the biology of everyday life. This can lead to scientific oversights in laboratory, field, and social sciences, as well as medical misrecognitions of basic human physiology as disease symptoms. It can also lead to the establishment of consumer markets predicated on the medicalization of once-natural human experiences.

In discussing the biology of everyday life, I draw on Henri Lefebvre’s (2002) discussion of “everyday life,” a set of expectations about daily life and lifestyles based on consumer goods and made available through emerging norms about middle- and upper-middle-class living in the 1950s and afterwards. Lefebvre suggested that the increasingly popular concept of “everyday life” for individuals in the North Atlantic served as an alienating force in the context of modernity, as individuals came to relate to themselves and to others through the expectations of the everyday, rather than—as any number of thinkers representing diverse traditions would have it, including Charles Darwin (2004), Karl Marx (1992), Donald Brown (1991), and E. O. Wilson (2004)—some more fundamental human nature prior to industrial capitalism, from which they became alienated. Science and medicine are deeply embedded in the capitalist structures that produce norms of everyday life, and biases based in historical and social expectations are often confirmed and reified through scientific knowledge production, instituting and solidifying hegemonic models of human nature that are at

odds with human plasticity and cross-cultural and historical records. A more supple conception of human plasticity and its interactions with the worlds that we produce is needed.

Human nature is a limit to potentiality (Taussig, Hoeyer, and Helmreich 2013).<sup>3</sup> This limit is plastic, allowing for a wide range of expressions. When biological reductivists argue that a particular behavior is hardwired into human physiology due to the forces of natural selection, they are accepting the lower threshold of the limit as its uppermost threshold. By examining the cross-cultural and historical records, one can find examples that demonstrate that the limit of human nature is significantly different from the biologically reductive approaches of those who would set the limit at the threshold. For example, against biologically reductive arguments about the “nature” of maternal instinct, there are examples of the ambivalence of blood kin to children (Scheper-Hughes 1985) and the importance of nonblood-kin attachment (Barlow 2013). The challenge is to ascertain what the threshold and limit to human plasticity are and how these are manipulated to produce particular kinds of societies and behaviors, resulting not in some monolithic conception of human nature but rather a variety of “local biologies” (Lock and Kaufert 2001). Knowing human nature as a product of the biology of everyday life means addressing the artificial barriers to and facilitators of human potentialities, which are set by the institutions with which humans interact, the dependencies we face in our social and environmental being, and the social and environmental exposures we face that negatively affect human potential. Each of these factors is shaped by power relations and is indebted to local and global histories that privilege some individuals and populations over others and emphasize some conceptions of normalcy over others.

Gilles Deleuze and Felix Guattari’s (1987) “body without organs” is meant to serve as a way to conceptualize how the body is composed through its social and environmental milieu; their understanding of the body is immanent rather than static, allowing for diverse forms of embodiment based on the worlds produced by individuals and societies. The “body without organs” also moves away from models of embodiment that emphasize continuity over change. This model of embodiment has been furthered by materialist feminists working in the same Spinozist tradition (Gatens 1996; Gatens and Lloyd 1999; Grosz 1994), who argue that the body, behavior, thought, and being are inseparable experiences of the world, and that the world is produced through human interactions with it. This model is not entirely alien to anthropology, and it finds resonances in the work of Margaret Lock and Patricia Kaufert’s (2001) elaboration of “local biology” as a conceptual framework for thinking about bodies and their cross-cultural variance. With a large number of soy-based phytoestrogens in Japanese diets, Japanese bodies are subtly remade, mitigating some of the elements of menopause that American and Canadian women experience. Moreover, because of the historical basis of this diet, the Japanese pharmaceutical and consumer

markets have not developed the same suite of products aimed at the experience of menopause, nor do popular narratives about women’s bodies emphasize menopause as a negative experience (Lock 1993). Japanese bodies are different from American and Canadian bodies, which is not due to some inherent “racial” difference but to everyday consumption and normative expectations. Institutionalized norms structure the experience of human plasticity.

The attention to local histories and the ways that they shape human bodily experiences points to what Norbert Elias (2000) referred to as “the civilizing process” and its relationship to ideas about “dirt” and social order (Douglas 2002), particularly in the context of the emerging state form in the eighteenth century and later. For Elias, the choices that societies and individuals make about which behaviors are either onerous and virtuous are arbitrary, but they have profound influences on how people eat and sleep, blow their noses, and other “natural functions,” including “behaviors in the bedroom.” What was once entirely sensible behavior—urinating in full view of one’s fellow diners during a meal, against a wall or in a chamber pot—becomes taboo, and individuals need to find increasingly private places for “natural functions” to occur, resulting finally in widespread indoor plumbing, sequestered toilets, and sewage infrastructure. These transitions depend on social pressure among peers and between social classes to ensure that the taboo of public urination is widely recognized and enforced. Elias points to these transformations in behavior and social organization as processes, not static assumptions, noting that how they operate as processes are reliant upon power relationships and the potential for uneven development across societies.

These changes in behavior and the rise of taboo thinking depend upon a sense of order and disorder in society, which accords with Mary Douglas’s (2002) conceptions of cleanliness and dirt. Douglas’s structuralist understanding of the production of order through the designation of certain kinds of objects as impure or dirty neatly captures the ways that societies conflate disorderly behaviors associated with the presence of dirt with kinds of people, thereby scaling up from individual and communal senses of order and disorder to whole societies and their systems of laws and traditions, as emblemized in the prohibitions around the consumption of particular kinds of meat or the comingling of specific foodstuffs. These prohibitions scale up to order society and also forge individual subjectivities, creating senses of propriety and orderliness—as exemplified in housekeeping ideologies in the United States, which target women and structure relationships within families (Hoy 1996). Douglas’s structuralism has been nuanced by William Ian Miller (1997) in his thinking on disgust. What Miller points to in changing sensibilities is “flux,” how something can be disgusting in one context and not in another. This flux accords with Elias’s (2000) understanding of the civilizing process, albeit without a sense of progression; flux captures the immanent nature of disgust—and bodily comportment more generally—pointing to how the structuring of the

biology of everyday life can change over time, throughout the day, over a lifetime, and from generation to generation, and how it is not indebted to a primordial human nature or transhistorical structuralism.

Elias also points to how “hygiene” is deployed as a means to conceptualize the need for particular kinds of behaviors. But “hygiene” as a justification comes long after the prohibitions of behaviors based on disgust. What Elias indexes is the growing power of the discourse of “biology” over the course of the early modern period, a historical span in which the biological becomes the subject of intense interest, first as a part of natural philosophy and eventually as a medical and scientific concern. The discursive construction of biology as a field of nature separated it from those fields ascribed cultural or social status (Latour 1993) and, over time, lent biology a power that transcended the powers of society or culture, evident in racist and sexist discourses that naturalized differences between people as based in biological understandings of “race” and “sex” (Laquer 1990; Roberts 2011). In time, these discourses would find their explanatory powers in smaller biological parts, moving from whole bodies to brains, then to genes. This has come to be understood as “biology as ideology,” thanks to Richard Lewontin (1993), where differences that are largely produced by social formations become inscribed as naturalized differences through scientific practices. Studies of intelligence testing (Gould 1996), diabetes research (Montoya 2011), sickle cell anemia (Wailoo 2001), and hypertension (Kaufman and Hall 2003) all provide examples of this process. Isolating differences in race, which is understood as immutable, renders social changes unnecessary, as any modification in social formations will founder on the claimed inevitability of biological determinism. Yet, critiques of “biology as ideology” have shown that human capacities are plastic within and between societies and that the material world shapes these capacities differentially (Downey 2005; Geurts 2003; Lock and Kaufert 2001). Attending to the biology of everyday life—how individual capacities are shaped by the worlds that individuals and communities inherit and build—makes clear that biology is not isolatable from its social context or determinants.

### **INSTITUTIONS, SLEEP, AND THE MAKING OF HUMAN NATURE**

The history of sleep in the North Atlantic from the eighteenth century through the industrial period was characterized by gross disparities, deeply held beliefs about normal and abnormal sleep, and the influence of market capitalism (Ekirch 2001; Reiss 2017; Wolf-Meyer 2012). The contemporary world of sleep is hardly different. Often, those members of society who are the most overworked—low-wage laborers, single or working-class parents—are also the most underrested (Williams 2011), while those among the upper-middle and upper classes are the most likely to complain of a poor night’s sleep and seek medical treatment for their complaints. Moreover, for many poor and working-class indi-

viduals and families, the conditions of sleep often compound lack of time for sleep, as beds, bedding, living conditions, and number of bed partners all impact an individual’s sleep (Burgess 1982). In contrast, for many in the middle class and above, the market for sleep technologies—alarm clocks keyed to circadian rhythms, ergonomic beds, consumer pharmaceuticals—has radically expanded since the 1990s, and the promise of a good night’s sleep has become ever more consumable, if also fundamentally elusive. In this section, I provide a brief sketch of the history of sleep in the United States and Great Britain, and then turn to the anthropology of sleep over the twentieth century. I then turn to the contemporary moment to think about how the scientific, medical, and popular ideologies of a “good night’s sleep” interact with the institutions that comprise everyday life in the United States that produce consolidated nightly sleep as a norm based in human nature and that shapes bodily capacities.

The historical evidence gathered to date increasingly shows that around the world people often slept in biphasic patterns before industrialization and urbanization, and many sleep biphasically still (Brunt and Steger 2008; Ekirch 2001; Paquot 2003; Reiss 2017; Worthman and Melby 2002). Rather than sleeping in one roughly eight-hour period from late in the evening until early morning, many people slept for two to four hours starting in the late evening, only to awake in the middle of the night for two or more hours, after which they would return to sleep for another two to four hours. Alternatively, an individual might sleep for a short period at night and again during the day. However sleep was arranged in the preindustrial period, contemporary reviews of the literature point to the ability of individuals to sleep between six and ten hours during a twenty-four-hour day (Macnish 1824). These sleep schedules were possible because many people were working for family-run farms or trades (Le Goff 1982; Thompson 1980; Weber 1976); if one was not related to his or her employer in a village setting, that employer was connected to the worker through close social affiliation. In this setting, arriving to work late due to oversleeping or needing a nap in the day might be accommodated (Le Goff 1982). When individuals moved to the emerging cities to take the growing number of industrial jobs, they found themselves working for managers with whom they had no social connection (Thompson 1980), and allowances were no longer made for individual workers and their sleep demands, as a steady stream of replacement workers were available for employers. Instead, the need to maximize productivity during daylight hours was paramount, leading to long and damaging workdays throughout the nineteenth century (Roediger and Foner 1989).

Critical here is that the population of laborers begins to be governed as a mass rather than as individuals (Hacking 1990). This governance begins on the factory floor but quickly moves out to society more generally as nocturnal activity becomes associated with criminal or nonnormative behavior (Palmer 2000). Curfews enabled police surveillance (Schivelbusch 1995; Schlor 2016), and

this was underwritten by an increasing sense of humans as diurnal animals in science and medicine (Wolf-Meyer 2011). As work times created a regular population of laborers, other institutions aligned themselves with this new temporal foundation, including schools for the monitoring of children (Lazerson 1971). What resulted from this was an emerging social order wherein everyone had a place to be at specific times of the day, and when individuals were not in their place, it was noticeable; hence, the rise of truancy officers for school-aged children and, over the nineteenth century, the rise in the medicalization of nonnormative sleep patterns. Integral to this transition was the rise of public health, which often targeted the behaviors of working-class and poor individuals, who were seen as living particularly unhealthy and antisocial lifestyles (D. Porter 1999; Rosen 1993; Rosenberg 1987). Taken together, these institutional and extra-institutional mechanisms of surveillance laid the groundwork for the increasing self-management of sleep behaviors, all of which were predicated on the increasing sense of the naturalness of eight hours of consolidated nightly sleep. These institutional and extra-institutional mechanisms of surveillance also helped to institutionalize a particular experience of sleep as based in human nature and biology, pathologizing other forms of sleep, including biphasic and polyphasic models, as well as family bedsharing.

Over the course of the nineteenth century, medical professionals and other public intellectuals slowly became involved in the push toward consolidated sleep on behalf of the growing industrial sector (Wolf-Meyer 2011); where once insomnia was a complaint only of the elite classes, increasingly it became a complaint of the working classes as they struggled to adhere to the demands of the new workday, and nineteenth-century physicians found monetary incentives in producing and selling sleep-inducing treatments (Hall 1861). Alongside these changes in the schedule of sleep, individuals also found themselves moving from family homes (where they might share a bed with two or more family members) to apartments and shared rooms (where they were likely to be sharing beds and sleeping spaces with one or more relative strangers). One constant is worth pointing out in this context: pests and nuisances were continual. In rural settings, individuals had their sleep affected by animals, domesticated and not, including dogs, cattle, pigs, chickens, rats, mice, insects like bedbugs and fleas, and environmental conditions that their homes could not protect them from. In cities, homes were prone to pests and the hubbub of urban life, including noisy roommates and heavy traffic.

While the working classes found themselves in these new conditions of sleep, elites continued to experience a flexibility with sleep that had been afforded to them previously. Although it predates the 1800s, one of the best descriptions of this flexibility and its costs is Benjamin Franklin's (1987) satirical portrayal of the French elite, in which he suggests that for economic reasons they go to bed earlier and wake earlier—rather than stay awake late into the night burning candles instead of using free solar lighting

during the day. The elite ability to stay up late was twofold: first, they had the resources to provide themselves with an expensive light source in candles, and, secondly, their work schedules—such as they were—were not driven by the availability of free natural lighting for agricultural or industrial labor. This is essentially the same model of sleep that exists in the North Atlantic today, with upper-class professionals having access to flextime, and tradespeople and laborers being subject to inflexible work schedules and, often, overnight and swing shifts (Basso 2003; Golden 2001a, 2001b). All of this adds up to make modern sleep and its basis in a human nature that was invented in the nineteenth century as a result of industrial capitalist arrangements of time and space: sleep is constrained by the demands of labor and school times, thought of primarily as a physiological problem mediated by medical treatment when it is disorderly, and deeply impacted by social factors like family structure and the need to work multiple jobs or during nonwork hours. In the United States, the everyday ideal of a good night's sleep depends upon a safe place to sleep, technologies that support sleep, and a normalized model of what that sleep should be, which is supported in the science and medicine of sleep as well as representations in popular culture and everyday institutions.

By the turn of the twentieth century, the model of consolidated sleep had taken hold in medicine and the physiological sciences as well as in US society more generally (Wolf-Meyer 2013), providing the basis through which individuals thought of their own behaviors as normal or not. By then, the workday had congealed into its current eight-to-nine-hour day, from eight or nine o'clock in the morning until four or five o'clock in the evening, in no small part due to unionization and labor struggles but also the solidification of standardized times for transit (Roediger and Foner 1989; Schivelbusch 1986). This concretization of work time allowed for the similar stabilization of school time for children, as school served as a mechanism for childcare while one or two parents worked or took care of smaller children (Lazerson 1971). More broadly, the consolidation of sleep meant that society could be technocratically managed, from the timing of streetlights, traffic signals, and garbage removal to the scheduling of construction and maintenance for the electrical grid and sewer infrastructure, the timing of deliveries to homes and businesses, the scheduling of popular media like radio and television, and the policing of populations through explicit and implicit means (Lefebvre 2004; Melbin 1987). The consolidation of sleep led to the spatial and temporal consolidation of everyday life more generally, and this consolidation led to the development of ideas about consolidated human sleep being based in nature, just as the diurnal work, school, and family day appeared to be. At the turn of the twentieth century, as laboratory science focused on sleep began, the consolidated norm of human sleep was the foundation upon which researchers built their science, ignoring historical accounts to see that the form of sleep they were working with was relatively new and geographically bounded.

Generally accepted as the father of modern sleep science (Dement and Vaughan 1999; Kroker 2007), Nathaniel Kleitman conducted his research at the University of Chicago from the 1920s through the 1950s. His magnum opus, *Sleep and Wakefulness* (1963), was first published in 1939 and updated in the 1960s, both to acknowledge advancements in laboratory findings about human sleep and to refresh his bibliography of extant sleep research. Kleitman’s bibliography ran thousands of entries long and included research published in languages from throughout Europe. At the time of his retirement, Kleitman donated his archive to Regenstein Library’s special collections at the University of Chicago, which had been unexplored and never cataloged when I arrived in 2006. Among Kleitman’s collection of trophies, awards, newspaper clippings, magazines, laboratory notes, and unpublished manuscripts were bundled notecards for his bibliographic entries in *Sleep and Wakefulness*. Though extensive, Kleitman’s interests in existing research seemed more focused on its existence rather than its findings; throughout his career, he focused doggedly on how circadian rhythms shaped human sleep and what indicators existed to predict the onset of sleep and wakefulness (Aserinsky and Kleitman 1953; Kleitman 1982), which led to his participation in the discovery of rapid eye movement (REM) sleep. His experiments drew on the local population of elite students at the University of Chicago and the nonuniversity community of predominantly black Chicagoans around Hyde Park. His most famous experiment involved descending into Mammoth Cave in Kentucky with a graduate student, where they spent days following a non-twenty-four-hour day (Wolf-Meyer 2013), but his local experiments largely focused on body temperature and its relation to a twenty-four-hour day and its basis in nightly consolidated sleep. Throughout his research, Kleitman seemed uninterested in exploring the possibilities of nonconsolidated sleep, which helped to enshrine consolidated sleep as the basis for the emerging science of sleep in the United States and elsewhere. By the time drug manufacturers began targeting sleep as a source of profit, they largely focused on producing drugs that ensured at least eight hours of nightly sleep. Drugs that upheld these social and scientific norms were successful, whereas those that produced only four hours of sleep had difficulty finding a niche in the pharmaceutical market (Wolf-Meyer 2012). Kleitman’s science helped to found a normative basis for human sleep and defined human capacities for sleep as based in consolidated nocturnal sleep, but it did not exist in a social vacuum; Kleitman’s beliefs about consolidated sleep were shared by the institutions that made up everyday life in the United States, which his findings helped to naturalize as based in a diurnal circadian rhythm shared by humans and the institutions they built, from workplaces to schools, to family relations, to recreation, like nightly patterns of child, family, and adult entertainment (Spigel 1992).

If scientists and physicians paid little attention to sleep and its variations throughout most of the twentieth century, so too did anthropologists ignore it, leaving a significant gap

in the ethnological record. What evidence ethnographers collected largely supported the idea of biphasic sleep patterns and contested the consolidated model of sleep that Kleitman and his followers accepted. Paul Bohannon (1967, 317), in his study of Tiv forms of time reckoning, noted that the Tiv broke the period of night into three phases: “sitting together” after sundown, “‘the middle of the night’ (*helato tugh*), which overlaps with the ‘time of the first sleep’ (*icin I mnya mom*),” and “the time of the second sleep” around “3 a.m. or a bit later.” This was the extent of Bohannon’s engagement with alternative sleep patterns, and he quickly turned to issues of time reckoning among the Tiv instead. But what Bohannon’s research helps to show is that among the Tiv in the 1950s there was an expectation that sleep was broken into two periods, making it functionally biphasic. “First sleep” and “second sleep” were terms widely used in the eighteenth and nineteenth centuries in the United States and Britain (Ekirch 2001). It is unlikely that Bohannon knew this historical context for his translation, but what is more important is that for the Tiv the naturalness of sleep was not determined by consolidated temporal arrangements of everyday institutions founded on capitalist organization of labor and consumption. Instead, the naturalness of their sleep was dependent upon their own social order, which likely had its own shared normative conceptions of sleep as being based in biphasic periods.

Bohannon’s brevity echoes the approach that other ethnographers have taken toward sleep. In the following two examples, ethnographers offered more thorough examinations of sleep, largely as they chafed against North Atlantic expectations about proper times of sleep and the social role of the sleeper. In so doing, they help to expose how naturalized the consolidated model of human sleep had become in the twentieth century, even before Kleitman’s science of sleep had attained dominance. Writing in the 1920s, missionary-ethnographer Laurentius Bollig (1927, 229) recounts how sleep among the Truk in Micronesia followed a nonconsolidated, polyphasic model:

The natives eat whenever they please and also sleep whenever they please. The time of the day does not matter. Many a European has envied the Truk people for their sound sleep. They sleep well anywhere, on the bare ground as well as in the grass or on a board. They do not let anything disturb them. However much noise and shrieking there may be in the vicinity, they lie down, begin to snore (*tor*), and are difficult to awake. When the Truk people want to awake somebody, they call his name in all variations . . . until the sleeper finally yields and gives an answer. To touch or to shake would be contrary to good manners. Their consideration for sleeping persons is boundless. When the signal for worship is blown, it would not occur to anyone to awaken sleeping members of the household so that they not miss it. When I once acted to wake up a sleeper, whom I absolutely needed, by a light touch, there escaped from the lips of all the spectators a compassionate Ooo!

One might rightfully wonder if the Truk were sleeping or simply resting when they lay down in these ways, especially with the cacophony that Bollig described, and particularly



in light of the fact that only calling one's name tended to rouse these sleepers. But Bollig's observations among the Truk quietly overturn the idea of a universal need for humans to have consolidated nightly sleep as well as the acceptance of the lone, individual sleeper, isolated in his or her bed, inoculated against the hubbub of society, which had become naturalized in the sleeping arrangements in the North Atlantic throughout the nineteenth and early twentieth centuries through apartments, single-family homes, and, eventually, suburbanization.

The following excerpt—which includes some problematic views on race—is a compelling portrait of the unintended effects of cultural contact and the transmission of ideas about sleep. Based on her missionary-ethnography work among the Ibo in West Africa in the 1930s, Sylvia Leith-Ross (1978, 86) suggests that consolidated sleep is based in human nature and that the adoption of biphasic sleep may be a negative effect of colonial culture contact:

Bedtime for children or adults is elastic. On the whole I should say the Ibo takes exceptionally little sleep. The children are up and about long after dark, the boys playing, the girls helping their mothers . . . . It is only during the rains, when the water lashes down upon hut and forest that the people get a full ration of sleep. They are not quite such early risers as those of the North, but also they take no rest during the day . . . . Unfortunately, contact with the white man is beginning to breed in the Ibo the conviction that an afternoon siesta is of paramount importance . . . . Doubtless the amount of sleep required varies with race and climate but one cannot help thinking that the Ibo adult would benefit by a longer period of silence and that the children would not pass through the almost universal phase of physical debility which follows babyhood if they had a rational amount of rest at night.

Leith-Ross quickly passes over her observations and assumptions about sleep. The Ibo clearly sleep in a nonnormative fashion, at least by Leith-Ross's standards; they seem to sleep in a consolidated pattern, but like Franklin's French aristocrats, they go to sleep late and sleep in the following day. In the context of influences from the "North," Leith-Ross sees the Ibo adopting a napping schedule as time permits but only as an effect of contact with "the white man." Before that, it seems that they were preternaturally short sleepers, awake late into the night and not sleeping throughout the day. At once, she assumes that the Ibo require less sleep than their white counterparts and suggests that children getting more sleep might lead to better health outcomes—both assumptions about the naturalness of sleep as being consolidated and nightly. Yet the first claim points to sleep's presumably biological variation in sleep need between the Ibo and whites, and the other claim assumes that "a rational amount of rest at night" would follow European standards of consolidated nightly sleep. Underlying these claims are contradictory impulses toward the flexibility of sleep and the determination of sleep needs as based in race, age, and climate—relatively immutable conceptions based in nature that would seem to have indelible impacts on the expression of human capacities for sleep and wakefulness.

As these few ethnographers help to make clear—each drawing upon fieldwork with different groups at different times, and all in the Global South—the views of sleep that predominated among ethnographers from the North Atlantic were based in ethnocentric conceptions of a good night's sleep rooted in ideas about the everyday as developed in the industrial period, and greater attention to sleep's variations has been warranted for some time. What these ethnographers also show is that what is understood as human nature is based on what has become institutionalized in a society over time. This suggests that the basis of consolidated sleep for humans is more dependent upon the everyday institutions that people have created over time and their need for predictable patterns of action than it is based in some primordial human need for nocturnal, eight-hour periods of sleep. Globally, where institutions are organized differently, so is sleep (Steger and Brunt 2003; Brunt and Steger 2008). Far from being a natural given, the model of human sleep that most people in the United States—and throughout the North Atlantic—subscribe to is one that is predicated on particular histories of labor and social arrangement that have reified specific biological models of human nature. With this model of consolidated sleep in hand, doctors (Dement and Vaughan 1999) and scientists (Yetish et al. 2015) continue to ignore social forces and the impacts they have on human behavior—and depend on the same model of nightly, consolidated sleep as the basis for the nosological definitions of pathology and the need for treatment. Such a model of aberrant human nature in relation to dominant institutional norms reifies the basis of institutions in nature, as if the diurnal structure of US workplaces is based in consolidated sleep as naturally occurring. This marks the nonconsolidated sleeping individual or society as abnormal and preserves institutional arrangements in the North Atlantic as beyond critique; it also helps to legitimate pharmaceuticals as a form of intervention in the control of individuals that work to align their pathological experience with institutional demands.

### **HUMAN NATURE ISN'T WHAT IT USED TO BE**

Anthropologists have long sought a model to fuse biological and cultural forces as a means to explain human variation within and across populations. Most recently, this has resulted in a "biocultural" turn that has brought attention to the ways that the political economy of globalization has produced uneven experiences of human health and well-being. The biocultural turn helped to provide a framework for conceptualizing epigenetics and the effects that environments have on individual bodies and populations. In conceptualizing the biology of everyday life as a framework, I posit that the primary motor in the variation of human expressions of physiological difference is the cultural, particularly as it is developed into institutional norms that shape expectations of normalcy, and that this includes what is thought of as "biology" in and beyond anthropology. There is no denying that humans—like all animal life—depend on sleep and that humans need approximately seven to nine hours of sleep per



twenty-four-hour period, which varies between individuals and over the life course, including much greater sleep needs for infants and children. How these hours of sleep are accrued in a twenty-four-hour period is subject to variation between and within populations, with norms based on expectations of sleep need and how it might be achieved; for example, in the United States, napping is accepted as based in the nature of infants and toddlers but not in full-grown adults. More perniciously, adolescents are expected to sleep as adults do, despite growing evidence that adolescent sleep needs increase significantly (Carskadon 2002; Hagenauer et al. 2009). The result of this mismatch between normative expectations of sleep, institutional arrangements in the form of school start times, and physiological needs results in a wide variety of “biological” experiences for adolescents, including attention deficits ascribed to the brain’s functioning, sleepiness and fatigue remedied through the use of caffeine and other stimulants, and low grades and test scores assumed to be based in innate intellect. Despite years of activism and policymaking in efforts to alter school start times (CAREI 1998; de Graaf 2003), Americans seem resigned to the contemporary arrangement of schools and the effects they have on individual students, which are often understood to be based in innate biological differences rather than the effects of institutional arrangements and norms. That some students are able to succeed despite these pernicious arrangements is widely accepted as a testament to their innate capacities and not based on their caffeine use, napping strategies, or daily sleeping schedule.

The example of sleep in the United States suggests that institutional arrangements of everyday life, which are founded on capitalist demands of productivity and value production and organize everyday experiences of time and space, profoundly shape plastic capacities for sleep and have a wide variety of downstream effects on human health, social organization, and knowledge production. But it is not sleep alone that is affected by everyday life and its basis in institutions, consumption, and the demands of postindustrial capitalism. All of the physiological experiences that humans have are similarly shaped. Among the social sciences, anthropology is particularly well positioned to account for how everyday life results in physiological differences between individuals and communities. Doing so requires moving beyond ethnocentric conceptions of human nature based in science that has developed in the North Atlantic since the 1800s, which has often been colonialist, racist, ableist, sexist, and classist. Joining ethnological, historical, and scientific accounts of human difference is a necessary step in seeing beyond the ideological constraints of everyday life and its relation to human experiences. Attending to the biology of everyday life also requires engaging with the banal aspects of human physiology, from sleep to digestion, breathing, excretion, eating, sex, masturbation, sensory experience, verbal and gestural communication, and beyond. In intercalated fashion, the permutations of industrial and postindustrial capitalism transform the limits of human

physiological experience, and anthropology is positioned to document these transitions and their consequences.

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## NOTES

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1. Sleep is generally categorized as falling into three categories: consolidated, biphasic, and polyphasic. Consolidated sleep is marked by one continuous period of sleep. Biphasic sleep is sleep broken into two periods occurring in a twenty-four-hour day. This can be either at night where after a period of sleep an individual wakes up for a period before returning to sleep or a period of sleep at night supplemented by a daytime nap. Polyphasic sleep is sleep that occurs in a series of short periods throughout a twenty-four-hour period.
2. Technology alone does not account for contemporary field scientists deciding to focus on sleep. The argument might be made that accelerometers, which are usually worn on the wrist and measure physical activity, have allowed for new engagements with human sleep in settings without reliable electricity. With accelerometers, particular patterns of movement are taken as an indicator of wakefulness, and data are stored on the battery-operated device and periodically downloaded onto a computer for analysis. There are obvious problems with the technology: periods of relative stillness might appear to be sleep, and active sleepers can appear to be awake (see, for example, the appendix to Yetish et al. 2015). The most reliable form of sleep observation is simple face-to-face observation. This was how rapid eye movement sleep was observed in the 1950s (Aserinsky and Kleitman 1953) and how clinical sleep medicine operates to overcome the vagueness of data produced by accelerometers, electrocardiogram machines, and other modern sensors. In fact, many portable technologies used in documenting sleep—like battery-operated rectal thermometers—have existed prior to the accelerometer, none of which led to the study of sleep in anthropological field sites. Ignoring the historical trends that shape scientific attention misrecognizes the economic and political interests in technological development as neutral and value

free (Bijker, Hughes, and Pinch 1987; MacKenzie and Wajcman 1985; Roberts 2011; Smith and Marx 1994).

- I employ Gilles Deleuze and Felix Guattari's (1987) conceptions of the "limit" and "threshold" in this discussion. A "threshold" is the lowest point that might be considered as facilitating a particular form of being; the "limit" is the highest point. Lower or higher—in terms of the existence and access to particular capacities—necessitate other forms of being in the world.

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