

KEVIN MCCAFFREE

A woman in a white dress stands on a ladder made of books, reaching for the sky. The ladder is constructed from two vertical wooden posts and several horizontal rungs. The rungs are formed by the spines of several thick, old books stacked on top of each other. The woman is positioned on the second rung from the top, with her arms raised towards the sky. The background is a bright, clear sky with a few birds flying in the distance. The overall scene is symbolic of reaching for knowledge and progress.

CULTURAL EVOLUTION

The Empirical and
Theoretical Landscape

Evolutionary Analysis in the Social Sciences

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Cultural Evolution

Since the dawn of social science, theorists have debated how and why societies appear to change, develop, and evolve. Today, this question is pursued by scholars across many different disciplines, and our understanding of these dynamics has grown markedly. Yet there remain important areas of disagreement and debate: what is the difference between societal change, development, and evolution? What specific aspects of cultures change, develop, or evolve, and why? Do societies change, develop, or evolve in particular ways, perhaps according to cycles, or stages or in response to survival necessities? How do different disciplines—from sociology to anthropology to psychology and economics—approach these questions?

This book provides complex and nuanced answers to these and many other questions. First, the book invites readers to consider the broad landscape of societal dynamics across human history, beginning with humanity's origins in small nomadic bands of hunter gatherers through to the emergence of post-industrial democracies. The book then provides a tour of several prominent existing theories of cultural change, development, and evolution. Approaches to explaining cultural dynamics will be discussed across disciplines and schools of thought, from "meme" theories to established cumulative cultural evolutionary theories to newly emerging theories on cultural tightness-looseness. The book concludes with a call for theoretical integration and a frank discussion of some of the most unexamined structures that drive cultural dynamics across schools of thought.

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Cultural Evolution

The Empirical and Theoretical Landscape

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First published 2022
by Routledge
605 Third Avenue, New York, NY 10158

and by Routledge
2 Park Square, Milton Park, Abingdon, Oxon OX14 4RN

*Routledge is an imprint of the Taylor & Francis Group, an informa
business*

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Library of Congress Cataloging-in-Publication Data

Names: McCaffree, Kevin J., 1985- author.

Title: Cultural evolution : the empirical and theoretical
landscape / Kevin McCaffree.

Description: New York, NY : Routledge, 2022. |

Series: Evolutionary analysis in the social sciences |

Includes bibliographical references and index.

Identifiers: LCCN 2021037089 |

Subjects: LCSH: Social evolution. | Culture.

Classification: LCC HM626 .M427 2022 | DDC 303.4--dc23

LC record available at <https://lcn.loc.gov/2021037089>

ISBN: 978-1-032-11736-2 (hbk)

ISBN: 978-1-032-11734-8 (pbk)

ISBN: 978-1-003-22128-9 (ebk)

DOI: 10.4324/9781003221289

Typeset in Garamond
by Taylor & Francis Books

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Introduction

The study of cultural evolution is fraught with confusions, terminological disputes, and pointless disciplinary boundaries. The study of cultural evolution is also wonderfully rich, incredibly complex, and carries with it a legendary pedigree. Indeed, the first sociological and anthropological theorists were cultural evolutionary theorists, and while many components of the earliest theories are now embarrassingly out of date—as, no doubt, future scholars will regard the present volume and its contemporaries—the pursuit of truths about cultural change across deep history will continue to animate the most adventurous minds until humans are no longer.

I say “adventurous,” but I might also use the terms “ambitious” or “foolhardy.” Any attempt to discuss the evolution of culture is an attempt to discuss thousands and thousands of years, billions of individual lives, and thousands of societies. It is a task one cannot complete perfectly; perhaps, it is a task that one cannot complete at all. All discussions at such a scale are sketches, all assertions generalizations, all generalizations abstractions. Given this, some might think that it is not worth the bother. But it is worth every bother. Questions about how societies change, and why, are forever significant, and every serious scholar owes it to themselves to attempt to find answers. Failure is less a concern than never attempting the adventure.

This volume, particularly in conjunction with the next, *The Dance of Innovation*, is my attempt to answer three central questions: what is unique about human beings? What is unique about human society? And how have societies changed, developed, and evolved over time?

Imagine a two-day conference. On day one, everyone meets in a room to discuss just what it is that needs explaining and offers their unique attempts to explain it. Then, on day two, a plan is offered for how to move forward in seeking new explanations or new frames of interpretation. In a similar way, this first volume will (1) summarize the origins of human societies along with their most stable characteristics; (2) sketch the outlines of cultural evolution from nomadic foraging bands to democracies; (3) review the most widely cited existing theories of cultural evolution; and (4) suggest a new synthesis and framework. The next volume will

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then (5) isolate the important components of human nature relevant for understanding cultural evolution as I understand it; (6) describe oft-ignored but critically important forms of information processing enabling (and also constraining) cultural evolution; and finally (7) describe the development of the central fulcrum of cultural evolution in my proposed conceptualization—infrastructure.

Without further ado, let's turn to the structure of the first human societies.

The Social Environment of Evolutionary Adaptedness

For most of their history, human beings and their hominin ancestors lived in small foraging bands. These bands were the social environment within which our brain evolved. An important argument in this book is that human beings, today, generally rely on their intuitions when thinking about social life. In order to understand a bit about the context of these social intuitions, it will be helpful to understand the circumstances of life as a forager.

Much of what I discuss below will be drawn from anthropological accounts of contemporary foraging societies. However, I must be upfront about the following caveat: contemporary foragers are not *necessarily* representative of Pleistocene-era human foraging societies let alone Miocene-era hominin foraging societies. As Robert Kelly (2013) points out:

“...modern foragers do not live in a world of hunters but rather in a world of Microsoft, Coca-Cola, World Bank-sponsored cattle ranches, international lumber markets and violent insurgencies. All live physically and socially on the outskirts of societies radically different from their own. They interact with these societies through trade, marriage, employment, conscription, and the course—and in some cases, they have done so for a long time...In brief, long before anthropologists arrived on the scene, hunter-gatherers had already been given diseases, shot at, traded with, employed, and exploited by colonial powers or agricultural neighbors...Foragers are not evolutionary relics and using these people to interpret [how social life would have been humans’ distant past] is no straightforward exercise.”

(Kelly, 2013, pp. 16–17)

No straightforward exercise, indeed. We cannot infer that all of the traits characteristic of foragers today were characteristic of foragers five hundred thousand or five million years ago. Many of the behaviors and practices of contemporary foragers are consequences or side-effects of their interactions

with other civilizations, civilizations that did not exist in our deep past. In fact, some foraging societies, such as those in tropical rainforests today, might find it impossible to live where they do, were it not for their trade relationships with industrial societies which provide them with iron tools and carbohydrates (Bailey et al., 1989; Headland and Bailey, 1991).

The question is not whether contemporary foragers mirror Pleistocene or Miocene-era foragers. They do not. The question, rather, is *what particular forms of social organization would all foraging societies tend to have in common, by virtue of the necessities of this form of subsistence?* Foraging is a mode of subsistence, a way of life. While contemporary foragers and ancestral foragers are different in many ways, there are certain inextricable and unavoidable challenges and opportunities that all foragers face. These challenges and opportunities combine in ways that tend to reveal a general and flexible, but discernible, social structure.

The very first instantiation of this social structure, in the hominins most ancestral to humans, was likely a combination of alloparenting (parenting with others), allohunting (hunting with others), alloforaging (foraging and seeking with others), and allodefense (defending with others). Durkheim referred to this form of social structure as a “horde.” Durkheim ([1893]1914) thought that the horde was the initial “form” of human society, the first instantiation of human solidarity. What made the horde notable to Durkheim was that it was not composed (only) of immediate family; it was, rather, a fluid coalition of allied friends and travelers trying to make due relying on one another in a harsh and unpredictable environment.

As Maryanski (2018) points out, Old World monkeys typically travel together in very tight-knit family networks, while non-human apes (like chimpanzees, gorillas, or orangutans) seem to prefer weak-moderate tie relationships and fluid, unencumbered roaming of their geographic space. Non-human apes do form occasional groupings based on shared interests, collective goals or similar personality, but these groupings are fluid and individuals seem to enjoy their autonomy and free movement throughout their range. However, Maryanski (2018) argues that, among non-human apes, chimps, bonobos, and orangutans are the most individualistic, self-dependent, and voluntary in their group membership. She writes:

“Indeed, chimpanzee communities mirror the quintessential horde hypothesized by Durkheim as his baseline formation for the origins of human societies. Thus, if we are willing to entertain the assumption that chimpanzees and early hominins after branching away from their last common ancestor were organized into horde-like macro-units of non-kin, Durkheim’s hypothesized horde arrangement is supported by the

data on chimpanzees. Since chimpanzees are so closely related to humans and in fact should be classified in a taxa closer to *Homo* because both are genetically closer to each other than either gorillas or orangutans, using chimpanzee data as a proxy for human hominin ancestors is not such a far reach.”

(Maryanski, 2018, pp. 262)

Humans are also quite independent and enjoy freedom of association and movement. Even if they do not act on such freedoms, having them available seems, for most people, preferable to arbitrary restriction. Kelly (2013) notes that human hunter-gatherers respect one another's desires to be mobile and autonomous. Because foragers have to move to find food, they come to value movement as an end in itself. However, forager mobility is also inextricably linked with sociality, knowledge transfer, and community cohesion. Hominins, and especially humans, occupy not just an ecological niche, but an informational niche as well, filled with norms, understandings of how to make tools, and instructions for ceremonies and rites (Pinker, 2010). Peoples' preferences for free movement and association aided in the development and spread of this cognitive niche.

Durkheim, for his part, was not specific about dating the origin of this “horde,” but I am reasonably confident placing its emergence in the Miocene period, and most likely the late Miocene. But, as with the dating of any form of social behavior in the archaeological record, phenomena like these emerged incrementally over millions of years. The emergence of horde-like social organization—alloparenting, alloforaging, allohunting, and allodefense—in hominins is hard to date because it would have co-evolved with other adaptations, such as the shortening of the intestinal tract, bipedalism, a descended larynx, symbolic communication, and so on.

Regardless of the date of emergence, this “horde” social structure would not have simply popped into existence, fully formed and cohesive. Indeed, human foragers of the “behaviorally modern” variety might be only 100,000 years old (Kelly, 2013). Turner and colleagues (2018) speculate that early bands of human foragers would have been increasingly structured around (a) male pair-bonding with immigrating females from other communities; (b) male coalitions; and (c) mother-son ties. To these, I would add increasing emphases on (d) alloparenting coalitions; (e) cooperative hunting of large game along with food provisioning for the sick and elderly; (f) cooperative defense of group boundaries; and (g) social/normative monitoring of bullying, coercive, males. This transitional social structure has some characteristics of chimp communities (e.g., male coalitions, mother-son ties, immigrating females, occasional suppression of coercive leaders) and some characteristics more recognizably human (e.g., male-female pair bonds during pregnancy/child rearing, cooperative hunting, systematic food provisioning).

As Maryanski and Turner (1992) have pointed out, modern humans seem to be chimplike in their desires for autonomy and self-dependence, but also somewhat unique in their emotionality and capacity for tribalism and group loyalty. Humans are an individualistic ape made social via the reciprocal effects of language, communication and emotionality.

Regardless of the specific date of its origin, we know enough about human evolution, the plausible structure of the early hominin “horde,” and the anthropology of human foraging societies to safely infer that the social environment to which the human mind adapted likely had the following five characteristics (depicted in Figure 1.1).

In the paragraphs that follow, I will discuss each point, (1)–(5), in a bit more depth. To do so, I will be referencing the anthropological literatures on contemporary foragers. As I said above, I do not do so because I think contemporary foragers are somehow fully representative of Pleistocene era foragers, let alone Miocene era hominins, but rather because foragers of any era *likely share certain general social-structural features in common*. (1)–(5) are broad, and I present them at a course grained level of generality.

Fundamentally, the alloparenting, allohunting, alloforaging, and allo-defense characteristic of hominins and humans emerged because individual caloric demands were often too high to be met by individuals foraging on their own. It is not just food that must be procured, but also the raw materials that enable the processing of this food, such as tools for crushing bone to better transport meat. Also, raw materials would have been needed for the making of items, such as baskets, enabling the transport of water or wood for fires (and the wood and water, itself, would need to be located and, possibly, defended). The dependence of human infants, the caloric demands of a large, developing brain and the caloric demands of nursing and child-rearing would have motivated ancestral humans to alloparent,

- (1) Efforts directed towards maintaining egalitarianism (i.e., maximization of each individual’s ability to contribute to alloliving)
- (2) Low population density and high mobility
- (3) Low territoriality and porous group boundaries (due to high mobility and periods of recurring resource patchiness)
- (4) Minimal storage of food and materials (due to high mobility)
- (5) Fluid and dynamic fission-fusion social structure (a novel, by degree, form of species-specific group information processing)

Figure 1.1 Five Foundations of the Social Environment of Evolutionary Adaptedness

Source: Adapted and modified from the term “environment of evolutionary adaptedness” first referenced in Bowlby (1969; 1973), then in Barkow, Cosmides and Tooby (1992)

allohunt, alloforage, and allodefend more consistently and more cohesively than any primate had before.

1.1.1 Egalitarianism

It is important to keep in mind that foragers live very mobile—that is, nomadic and semi-nomadic—lifestyles. Though there is wide variation, modern foragers typically spend each day in bands of no more than 30–50 people, though on any given day foragers can be found working with, or discussing daily affairs with, smaller family groupings or larger tribal consortiums (Kelly, 2013). Sometimes, individuals sharing a superordinate tribal identity will decide to emigrate to another band, which can temporarily raise the population numbers of that sub-group. Or, individuals might marry into a new residential or community grouping. However, in either case, this migration between various groups of the same tribe is informal, loosely regulated and typically serves to balance population numbers across bands (Kelly, 2013).

Within a tribe or clan, bands tend to fission into subgroups at around 50 people (Kelly, 2013), and larger communities tend to fission into sub-communities at around 150 people (Dunbar, 1993; Kudo and Dunbar, 2011; Dunbar, 2016). The entire foraging tribe/ethnic group rarely grows beyond 500–2,500 people, and it rarely grows even to that size. Figure 1.2 depicts a schematic of the typical embedded layering of a moderate to large sized forager society.

This embedded layering is not random, but rather reflects the size of the human neocortex. The size of a primate brain is a fairly reliable indicator of the preferred size of social groupings (the so-called “social brain hypothesis” see Dunbar, 1993; 2004). And, while there are obviously other factors which influence group sizes—everything from the prevalence of disease to warfare to predation—the volume of neural tissue in the prefrontal cortex is not an insignificant influence. There are, after all, only 24 hours in a day, and it takes time, reflection, and emotional effort to meet and learn about new people; among other reasons, this seems to be why humans coagulate into dependably similar group sizes. On this matter, Dunbar and Sosis (2018, p. 106) write:

“Although humans are capable of living in structurally diverse societies, our communities, even in the digital world, have a distinctive layered structure with successive cumulative layer sizes of 15, 50, 150, 500 and 1500... While the smallest of these is not normally a stand-alone grouping, the others appear as natural community sizes in hunter-gatherer societies...[This embedded layering has also been found] in both offline and online egocentric social networks, which are characterized by distinct layers that represent quite specific

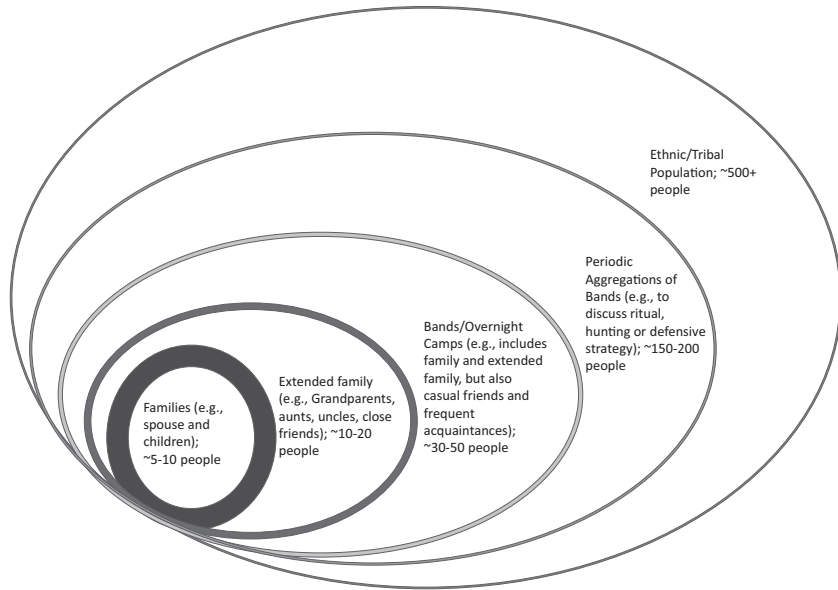


Figure 1.2 The Embeddedness of Daily Life in a Foraging Tribe

Source: Adapted from Kelly (2013), Hamilton et al., (2018), Dunbar and Sosis (2018)

frequencies of interaction and levels of emotional closeness, reflecting the levels of intimacy that individuals maintain with each other. Even more surprisingly, perhaps, Kordsmeyer, MacCarron, and Dunbar (2017) found that the sizes of residential campsites in contemporary Germany also adhere to these values.”

Foragers seem to roam a fairly consistent, but large, geographic range and set up overnight camps about every 6–7 miles in order to follow herds of game animals, schools of fish, or blooming fruits, nuts and tubers (Kelly, 2016). This nomadic way of life means that no location is home for too long, and because of the constant moving, individuals carry few personal possessions. Because people in the band have only a few personal belongings to their name, material inequality between them is low. Moreover, everyone in the band is known—they are either a friend or a family member, and all share superordinate identities as members of the band or larger tribe—and so perceptions of familiarity and similarity are high enough to ensure consistent empathy for those in need (as I argue in McCaffree, 2015).

In fact, forager camps are often referred to as “home bases,” (Oesch and Dunbar, 2018) because they are the place where small children, nursing mothers, injured people, and the elderly stay during large game hunts, or when other adults are out foraging for small game or plants. After a

successful foraging trip, or after a large successful hunt or fishing expedition, food is brought back to home base to feed the young, injured, nursing mothers and elders. This home base is the *most fundamental unit of human social organization*, even more fundamental than the family, and certainly more fundamental than the elaborated alloliving which can eventually develop out of the home base. In ancestral hominins and in human foragers, individuals who were not genetic family members (i.e., not parents, children, aunts, uncles, cousins or grandparents) could still join the “home base” of others, and contribute to the small economy of hunting, food sharing, and cooperative child-rearing. Perhaps these individuals were initially trading partners or members of another, nearby, home base which dispersed (Flannery and Marcus, 2012).

In their communities, foragers seem to follow a “demand-sharing” norm, whereby individuals are allowed to beg and request goods or materials but, once given these items, the giver has the right to make reciprocal requests in the future (Peterson, 1993; see also Trivers, 1971). As Peterson (1993) points out, demand-sharing among foragers is shorn of the usual altruistic overtones of generosity—demand-sharing involves some begging, requesting, and demanding goods, and others begrudgingly giving in and providing those goods and materials often out of a combination of annoyance and appreciation for their own reputation (after all, having the ability to procure enough resources to share is a good signal of one’s skill and abilities).

It is also important to note that forager groups are not, and likely never were, egalitarian in any perfect, ideal sense. When anthropologists use the term “egalitarian” to describe hunter-gatherers, they are speaking relatively. Foragers appear to be relatively more egalitarian compared to the extraordinary inequality we see in our modern societies. In large part, this is because foragers have less to hoard, but it is also because what they do have is essential and will need to be shared with all properly cooperating others in order for a system of alloliving to be sustainable.

However, there are many ways in which forager societies, speaking generally, are not quite ideally egalitarian. Centrally, child-rearing is a significant energy burden on mothers, as they must carry and nourish a fetus for (perhaps) nine months, breastfeed for years after, and be saddled with dependent toddlers while foraging. Men typically help with these tasks to the degree they can, but Robert Kelly and others report an interesting observation. Since, of course, pregnant or nursing women will have a more difficult time hunting large game animals or fighting off raids, it seems the greater the emphasis on meat eating or warfare, the longer men tend to spend time away from mothers and children, and spend more time hunting or fighting or, in some cases, trading (Flannery and Marcus, 2012; Kelly, 2013). Despite the burden of childrearing, women are often also engaged in basketry, pottery, firewood collection, water hauling, and other tiring daily activities (see especially Kelly, 2013,

chapter 8). So, among foragers, there is a consistent division of labor with regard to child-rearing, owing to the obvious biological imperative for birthing and nursing. During these periods, women are more vulnerable than men and, given the high rate of maternal death in foraging societies the only equivalent for males is risk of death in warfare.

Another way in which foraging societies fall short of an egalitarian ideal is with regard to the apportioning of status. People within bands, and certainly within tribes, will vary in their social statuses as hunters, medicinal healers, musicians, net-makers, and everything in between. This status does not endow anyone with the right to coerce or steal from others, but it might impact the amount of influence the individual has in the group hierarchies which tend to form when social coordination (for childcare, hunting/resource foraging, defense) becomes particularly important.

So, “egalitarianism” among foragers does not mean everyone was identical, with similar burdens and similar needs. Rather:

“What egalitarian means [in foraging societies] is that *everyone has equal access to the critical resources of life*: food, water, mates, living space and the technology to acquire these. The only variable is individual talent and effort, and the power that such differences might bestow is kept in check by peer pressure. [Foragers] make sure that no one thinks himself or herself superior, even those who truly do have superior abilities,”

(Kelly, 2016, pp. 96, italics in original)

1.1.2 High Mobility

It is important to keep in mind that (1) game animals migrate in herds, are often difficult to hunt successfully, and are subject to predation by other animals, not just other humans, so timing can be critical; (2) fruit, nut and tuber prevalence is seasonal; and (3) children/young people, pregnant women and the elderly, in particular, require care and support. Given that survival is dependent on the availability of resources, and because foragers must remain mobile (and easily mobilized) in order to access the resources that keep them alive, they tend to keep their population numbers low. To do so, foragers often internalize norms encouraging periods of sexual abstinence, as well as norms allowing infanticide and abortion (Kelly, 2013). Another reason why forager community populations tend to be small is wholly involuntary: many forager women cannot get pregnant as a result of nutritional deficits and workload stress (Kelly, 2016). Moreover, owing to a variety of threats and dangers that I will discuss below, only half of all children born in foraging societies live to see adulthood.

The structure of the ecology can also influence how mobile a forager population becomes. Foragers in heavily forested environments, for example, have less access to edible plants and fewer large wild game to hunt, motivating them to hunt across a larger geographic range. This dispersion reduces population density below that of foragers in areas where resources are more plentiful or easily accessed, such as a forager community living along a river teeming with salmon which they can hunt for meat. Or, consider that foragers in very cold climates can freeze their food, making it easier to store. The more easily food can be stored, the more sedentary they become, because it is harder to move around if one has to lug around large baskets of food (especially with children in tow). Food storage, then, will also tend to correlate with higher population density, and also increasing material inequality, among semi-nomadic or sedentary foragers.

I should also make a few points about bipedalism since this evolution of humans' skeletal structure is obviously a significant reason why ancestral humans were able to endurance hunt and walk long distances. But, I want to suggest that there is more to bipedality than just this, so I will say a bit more.

Bipedalism, or upright walking, can be identified in the hominin line in its earliest form 4–6 million years ago, and today among mammals, only humans walk upright for long periods. The evolution of bipedalism involved changes to the base of the skull, spine, pelvis, legs, and feet. Like any evolved trait, the evolution of bipedalism was probably influenced by many factors: walking around comfortably on two feet allows an animal to use their forelimbs in order to reach and manipulate food, objects, or the hands of others. Less obviously, bipedalism would have reduced the surface-area of skin exposed to the sweltering savannah sunlight, thus requiring only two-thirds of the water of a similarly sized primate walking on all fours (Kelly, 2016). Bipedalism might also have been influenced by dietary changes, namely a larger intake of protein, tropical grasses, and sedge 3.5–4 million years ago (Fahy et al., 2015).

Bipedalism also would have freed up the hands for carrying weapons as well as food or water. Quite critically, bipedalism also freed up the hands for manipulation of tools and for constructing innovations in infrastructure. The evolution of bipedalism additionally narrowed the birth canal of pregnant females, thus necessitating even earlier (i.e., premature) birth (Lovejoy, 1988). Given that, the successful premature birthing of a still-developing fetus, along with the socialization which follows for many years after, requires alloparenting, we should not understand the evolution of bipedalism as a process utterly distinct from alloliving. Running and hunting were facilitated by bipedalism, but so too was the ability to use one's hands to provision for others more generally.

I would also like to underscore some other nuanced points. Moffett (2019), for example, argues that the evolution of bipedalism would have better enabled adornment of the torso, arms and neck with various symbolic tribe/ethnic identifiers. The upright (and hairless) human body becomes, as he says, a “billboard.” Others (e.g., Pontzer et al., 2009) note that bipedalism might have been more energy efficient—at least it was not less energy efficient—compared to quadrupedalism, potentially freeing up valuable caloric energy to be used cognitively, that is, for purposes of emotionality or language.

I must suggest something further, something even more subtle, but with potentially profound effects. Bipedal animals, facing each other, have their most vulnerable body parts exposed—the wrists, the neck, the stomach, the chest, the genitals. Quadrupedal animals have an inborn defense as a simple function of the orientation of their physiological body plan in space. Standing on four legs, some of non-human animals’ most vulnerable body parts face down at the ground, not toward their potential adversary. I have not seen anyone explore the implications of this, but if I have overlooked someone who has, I certainly hope to be corrected.

This intrinsic vulnerability imposed on an animal by evolved bipedalism would, I suspect, make coalition formation and an associated emphasis on familiarity unusually important relative to other animals. It is easier to be emotional and more important to feel trusting of others when the veins and organs most directly responsible for your survival are left exposed to the open air. The stakes for conflict and predation rise; symmetrically, the benefits of coordinated allodefense rise as well. In short, the evolved skeletal structure facilitating bipedalism might have a secondary effect as an accelerant to the development of neural tissue for emotionality and group cohesiveness.

1.1.3 Low Territoriality and Porous Group Boundaries

It is of course true that if a group of foragers happen upon a resource-rich stretch of land, and have been deprived of resources in the recent past, they are likely to develop a “we were here first” attitude, and defend the resource patch from outsiders of a different tribe/ethnic group (Flannery and Marcus, 2012). Scarcity, especially scarcity linked to a geographic territory, will make any animal defensive and territorial. Territorialism in this sense would be adaptive and conducive to survival. However, if a resource patch was not terribly rich or was, for whatever reason, hard to defend, foragers would have remained mobile. The human mind reflects this duality intuitively: become territorial when survival is at risk, otherwise, relax and make mutually beneficial contacts with others.

Though the evidence is mixed on non-human apes, we can say with some certainty that human foragers are not dispositionally or innately territorial relative to other apes (Kelly, 2013). Well, it seems that they are more flexibly territorial, to be precise.

Foragers need to be mobile in order to adapt to the availability of resources, and this means that any particular stretch of land is only useful for a time. Eventually, the fruit tree will be picked clean, the tubers will be dug out of the ground or the herd of antelope will have moved on. Foragers, of course, value the resources they depend on, in fact, they see their world as thoroughly animated by various combinations of nature spirits, nature gods and nature ancestors (as when a tribe believes itself to be descended from or related to another animal species such as wolves or bears). Nevertheless, when it comes to a specific square footage of savannah land, foragers understand that getting too attached makes little sense. Following the food takes precedence and, besides, if foragers were to stay in one place for too long, their buried urine and feces might become a smelly nuisance (and a potential health hazard). As I mentioned above, foragers also migrate freely to other nearby bands, and sometimes marry someone of a different band and relocate, indicating that what seems to matter most to foragers is their *band or tribe identity*, less so the land they happen to be sleeping on at the moment (see Moffett, 2019 for an extended discussion).

However, it is equally important to point out that, in situations where food is scarce and many bands of different tribes are present in a single geographic area, violence and warfare are likely. The more people anticipate or engage in warfare with each other, the more land, and the defense of a given home base, become proxies for safety. When you are worried about being speared to death because you took a few steps too many into the wrong territory, or you're worried about sleeping through the night without being raided, feeling *safe on your land* becomes a paramount preoccupation. So, while humans are not very territorial relative to other apes and especially monkeys, this is because forager bands remain fairly small, which keeps population density low, and allows for the sufficient availability of food and roaming territory. But, where food, water or other valuable resources are concentrated, where population density is high and where groups of different tribal identities are "circumscribed" or locked in a perceived competition for resources (see Carneiro, 1970; 1978), the likelihood of violence rises.

Humans, as discussed above, can also create fictive kin networks and thus include relatively unfamiliar others as "friends" or "family." These fictive kin networks can reduce territorialism and motivate the trading of food, items, information, and martial partners. Still, if resources are scarce or poorly distributed ("patchy") and land is limited, the benefits of trade will be asymmetrical at best and the sharing of prized information about resources could lead to even further conflict.

Some foragers move to specific locations, such as near a river, and then coordinate so that food is foraged from elsewhere and brought back to a stable home base. Foragers with this approach to resource collection will

tend to be relatively more territorial. However, other foragers move to new locations as a group in pursuit of new resources and do so on a more continual basis. These foragers might set up a prolonged camp only rarely and will therefore tend to be relatively less territorial. Whether foragers set up semi-permanent or permanent camps in particular locations and send out individuals and sub-groups to find food, or, a forager group as a whole moves consistently in pursuit of resources seems to have to do with resource patchiness. When a valued resource is concentrated in a specific location, forager groups will be more likely to set up semi-permanent camps around the resource; on the other hand, when valued resources are more equally distributed throughout the environment, foragers will pick up camp and move more frequently. When resources are *extremely* scarce, it seems that foragers move shorter distances, more frequently (Kelly, 2013).

While foragers are not necessarily territorial, they do of course have a vivid sense of tribal/ethnic identity, and these identities are often linked to particular sacred locations and myths associated with these locations. For example:

“Australian aborigines have a rich mythological history referred to as the Dreaming or Dreamtime, a period during which mythological beings moved across the land, their paths or tracks memorialized for their Aboriginal descendants via the topographical features they created in their adventures...The Dreamtime also forms the cultural logic through which Pintupi [a forager group] negotiate their identity with each other. A Pintupi man can potentially become one countrymen with another Pintupi man who is associated with site A: (1) if the first man was conceived there; (2) if he was born at a place made by or identified with the same Dreamtime beings as those who created A; (3) if the story line associated with the man’s place of conception is associated with the story line of the Dreaming associated with A; (4) if the man is initiated at A; (5) if the man was born at A; (6) if conditions 1–5 hold true for his father; (7) if his mother was conceived at A or if conditions 2,3, or 5 are true for her; (8) if the man’s grandparents were conceived at A or conditions 2–5 are true for the grandparents; (9) if the man lives around A; and/or (10) if the man’s close relatives die at or near A.”

(Kelly, 2013, p. 155)

As the above passage makes clear, highly intricate and complex symbolic band and/or tribe identities are a fundamental component of how human foragers sort themselves. Critically, however, land or territory per se are not generally what determines shared tribal/ethnic identity but, rather, an individual’s *social relationship to* that land or territory. The important point here is that land is less a social construction than are relationships, making identity, especially in humans, highly negotiable and malleable.

Consider the nuance of *just* point 3 in the passage above: if my biographical details can be construed as being linked to some interpretation of your group's ancestral myths, then I can be considered a member of your tribe/ethnicity. Of course, this is easier said than done, because people from one tribe must consider the plausibility of another person's life details in relation to their understanding of their own ancestral myths. No doubt much of the eventual decision is made on the basis of how well known the outsiders' wider social network is, their personality and skill-sets, along with the practical concerns of existing tribe size and resource patchiness of the surrounding area.

My point here is that even when identity is tied to land, unless conditions are unusually harsh or resources unusually limited, peoples' superordinate tribal identity tends to be construed as symbolically and abstractly as possible, in order to facilitate inter-marriage, trade, and alliance formation. Symmetrically, it is fair to say that the more tied identities become to land, again, typically during periods of relative resource scarcity, instability or patchiness, the more peoples' identities become parochial, violent, "nationalistic."

1.1.4 Minimal Storage of Goods and Materials

Nomadic hunter-gatherers might keep a small amount of nuts or roots to eat, or cooked meat, or some valuables like paints/pigments, shells, or tools as they trek to a new home base, but they do not maintain anything like the large stores of grain and other resources that we see in horticultural or agrarian societies. Food storage is minimal, in large part, because foragers lack an efficient means of refrigeration (though burying food can help), and because food is sometimes plentiful enough (given low population density) that it does not need to be stored. Foragers are known to eat large amounts of insects like grubs, caterpillars, grasshoppers or moths and these are plentiful (Lesnick, 2018). They are also nutritious, calorie-rich, and easily digested (Verkirk et al., 2007).

Forager groups that settle near a stable food source (i.e., a stream) tend to store more food and materials because, being less nomadic/mobile, they can afford to stockpile. Foragers rarely settle permanently the way those in farming societies might: droughts, insect infestations, waste management problems, floods, and the like tend to keep foragers moving about a territory. Maritime societies (those whose economy is based in fishing) are often the most permanently settled foragers—in essence, they are proto-farming societies, although the "crop" that they grow and harvest is fish.

However, as mentioned above, if other sedentary forager groups live nearby—especially if these groups belong to different tribes or ethnic communities—war or violent conflict might be required to depose them

from their land (Kelly, 2013). Partly, this is because semi-sedentary forager groups steadily lose their logistical flexibility to mobilize their people quickly for a move. And, partly, this is because foragers become comfortable extracting food and resources from a spot of land that they have come to know very well; fishing, for example, takes learning new skills (hunting whales requires the coordination of numerous people collaborating across boats) and relatively sophisticated technology (like nets, weirs, or boats), all of which can make a sudden reversion back to large land-animal hunting (itself a complex enterprise) disorienting. But, also, forager groups become resistant to moving because their sedentism has enabled them to make or acquire more materials and/or stored food.

Flannery and Marcus (2012, pp. 33–34) speculate that minimal food and material storage might have motivated foragers to hoard social obligations instead. In their words:

“We wonder if [foragers], forbidden by society from accumulating surplus food, may instead have been accumulating social obligations. Their alleged altruism, in other words, could be seen as a self-serving investment, a way of obligating [others in the band to help] them in the future when their situations were reversed...Again, we see one of the most basic premises of egalitarian [forager] society: If one wants to be well thought of, he will be generous. If he strays from this ideal, he will be reminded of it with humor. If he persists in not sharing, he will be actively disliked.”

I think it is likely that the lack of hoarding and storing of material goods in early human societies, amid the substantial growth in abstraction and symbolic complexity afforded by the neocortex (with its connectivity to enlarged subcortical tissue dedicated to processing emotion), led to a vacuum of meaning-making and distinction-making. Species of *Homo* could more and more imagine and adopt nuanced self-understandings, even if they could not always produce large amounts of material goods. Regardless, outside of speculation about origins, the day-to-day maintenance of reputations (or, perceived group obligations) keeps social life cohesive in forager societies.

1.1.5 Fission-Fusion Social Structure

Before turning to how fission-fusion operates in forager societies, I should first make some general statements about fission-fusion as a social mechanism of group adaptiveness.

In this book, and especially in the next volume (titled *The Dance of Innovation*), much ink will be spilled on this concept of fission-fusion oscillation. There are two basic reasons for this. One reason is that for too long, social theorists have focused on states of integration *or* states of

differentiation, or on the processes producing states of integration *or* differentiation. Less discussed is the rhythm, and there is a rhythm, to the oscillation of fused states coming apart into fissioned states only to reassemble into a potentially newly composed fused state. There is a culturally calibrated dance occurring between fused states and fissioned states in human societies, and this dance is not only one of oscillation but also of the particular forms that this oscillation takes.

Another reason is because fission-fusion oscillation is how humans process information, as groups. You see, alloliving is not just a life-extending safety net for a vulnerable, big-brained primate but, also, alloliving is also a form of information processing capable of generating ideas, beliefs, norms, and tools quite irreducible to any one individual. Fission-fusion oscillation, in particular open-system fission-fusion oscillation, constitutes a new, higher-order information processing system which has built and will continue to build our most unusual (in the animal kingdom) human societies.

We might say that fission-fusion oscillation is a mechanism for sampling and sifting and sorting peoples' interests, contributions, personalities and goals. As an ideal, it optimizes the fit of particular individuals for particular collective pursuits.

Let's take a step back.

Consider this passage from Maryanski (2018, pp. 266–269) which might also, aptly enough, describe fission-fusion in small human forager groups:

“A chimpanzee society [is composed of] relatively few kinship bonds and a fission-fusion system that revolves around self-reliant individuals who move about alone or join temporary gatherings. This social structure is adaptive for such large bodied primates whose dietary needs mandate the flexibility to forage independently in a forest environment with seasonal, scattered resources. So a weakly tied network structure is an adaptation that fosters a self-governing freedom for individuals to forage largely unencumbered...chimpanzee communities [also] evidence long term stability and intergenerational continuity over time... chimpanzees usually elicit greeting rituals that vary from vocalizations, patting shoulders, and kissing hands to embracing good friends... During the day individual members pass time by joining others in a variety of social activities but, otherwise, stable groups do not exist... How can integration spring from such self-reliant individualists who often forage and wander about by themselves, with some members not seeing each other for weeks or months?”

For Maryanski the answer is that chimpanzee society *is* precisely the rhythmic coming together and going apart, coming together and going

apart, which across space and time, provides the intuition that there is a superordinate unit to which others belong, a “community complex,” (Maryanski, 2018, p. 271; this expresses an idea compatible with a theory developed by Lawler and colleagues, 2009).

Humans are unique, though, Maryanski insists, because our neuroanatomy allows for a greater capacity for symbolism and emotion, which can help bond individuals to roles, or to shared symbols/totems to a degree that allows for population scaling—sub-populations can always be represented as a component of another, larger/more general symbolic population which can be further represented as a component of yet another, even more abstract and general symbolic population and so on. Compared with chimpanzees, then, it would seem that human fissioning-fusing involves navigating more complex identities and more complex roles when dispersing (fission) and when combining or recombining (fusion).

Let’s now consider some very broad and general conclusions from the anthropological and archaeological work on *human* foraging societies.

First, some definitions. Fissioning occurs when groups disband or separate; fusion occurs when groups aggregate and, to some extent, interact. Fission-fusion is a process and a mechanism, not an event. In particular, it is the process of coming together only to eventually separate—or separate only to eventually come together—and it is the mechanism by which groups, as groups, maintain stability, cohesion, and innovative adaptability.

Groups (and the individuals comprising them) do not necessarily fuse-fission with any intentionality, though they might. But, there is a subtle regulating principle which, in principle, operates independent of peoples’ explicit awareness: fission-fusion oscillation involves a negotiation between individual autonomy and group integration, and individuals might cease aggregating and interacting if they (1) feel little or no commitment to, or think they derive little or no benefit from, others in the group; or (2) because the group has become so rigid and focused on norm-enforcement that people feel constrained.

If people do not aggregate and interact, new information and experience—necessary for the vibrant creativity and flexibility of adaptive responses—will not be shared and cumulatively modified with the input of others. On the other hand, if people do not fission to some extent with some regularity, the group might become so fused that any new, good, idea will be regarded as an offensive affront against more established ritual or practice. Yet, if a group fissions too much or too quickly, damage can be done to in-group alliance-formation or social coordination. And if a group fuses too rapidly or for too long, it risks inflexibility and needless rigidity of its hierarchy and social practices.

During fission periods, individuals are relatively more autonomous, and cover a roaming range relatively more unique to them. Even if someone is

roaming around with a friend, their specific path may be unique to them; the whole community or society is not following close behind, requesting or requiring a particular route of walking or of thinking. When a group disbands to some extent, then, individuals and smaller units become more available to perceive new experiences, territories or ideas. During fusion periods, individuals are relatively less autonomous, and cover a roaming range more correlated with others in their group or society. Fusion states motivate and facilitate the integration of information in the form of emotions and body language or in the form of verbally articulated experiences or ideas. Groups that are too fused/over-integrated will absorb less new information because communication will be too rote, regulated or habituated. Generally, groups that are not fused enough/under-integrated will absorb less new information, because interpersonal contact will not be sustained long enough for a useful or memorable communication to transpire.

In less stable ecologies (e.g., those ravaged by natural disaster or disease) or under less stable social conditions (e.g., war, civil conflict), perceptions of threat will tend to cause groups of individuals to fuse (or “tighten,” see Gelfand et al., 2011; Gelfand, 2019) in order to better internally coordinate and thus mobilize a response to the threat at hand. In addition, the more fused or tight the group, the more individuals in the group might begin to prefer the quick and panicked, but protection-focused, judgments of decisive, if coercive, leaders (Aktas et al., 2016). Idealistic, open-ended, group deliberation is less preferable under threatening circumstances, and, thus, the perception of increasing threat will tend to slow down the interpersonal dissemination of new experiences or ideas. Nevertheless, to the extent that a fused group’s response to threat is adaptive or helpful (in one way or another) such a group will better survive because it will better deploy this response in a coordinated and consistent manner relative to a less fused group.

Fission-fusion oscillation is, therefore, a generic property of societies, not of the individuals who comprise it—fission-fusion oscillation is a fundamental dimension of group organization and continuance.

Among foragers, individuals and groups fuse together for a variety of reasons, perhaps centrally: (1) because people have seemingly innate desires for some degree of group belonging and social support; (2) to coordinate hunting/defense/care or disseminate the spoils of various forms of resource extraction; (3) to share gossip about peoples’ reputations and relations to others, good and bad, within and between societies; (4) to arrange marriages and other coming-of-age rites, as well as religious rituals; (5) to arrange trade relationships and to engage in trade; and (6) to share information about the state of the surrounding ecology (Brown, 2000; 2004; Dunbar, 1996; 2004; Kelly, 2013; 2016).

Foragers also fission for a variety of reasons (see Figure 1.3): (1) people have seemingly innate desires for some degree of autonomy and freedom of movement; (2) people trade, marry and interact with a number of different individuals *between* groups; (3) sometimes individuals hunt, forage, build materials (e.g., nets, baskets, spears, ceremonial pigments) independently, or just seek time to themselves; (4) tensions within a group rise to the point that people separate to cool off or to form new bands or residential groupings; (5) war or disease leads to a temporary disbanding; or (6) resources become sufficiently scarce that individuals perceive a need to forage more independently.

Recall that, in forager societies, the “home base” is a place where collections of residential groups reside. Home base is where meat from large game animals is returned after a successful hunt. It is where, after a long day, everyone comes back to eat and share. It is where children and the elderly stay when mysterious noises are heard at night and others go to investigate. It is the central organizing place for a group of families who share a tribal or ethnic identity. This is an obvious site where fusion takes place, and it involves not only the aggregation of family groups, but also those who marry into a family group or visitors and traders who are able to negotiate membership in the tribal community.

The band is also an important unit of forager society, and I am using it in a way roughly equivalent to the “home base” unit. A band is simply a group of cooperating foragers pursuing some short or longer-term goal, and foragers fluidly circulate between bands of the same tribe/ethnicity. If a person from one band of the same tribe/ethnicity wants to spend the day hunting (or gathering, or whittling, or weaving or discussing) with a person from another band of the same tribe/ethnicity, they are typically

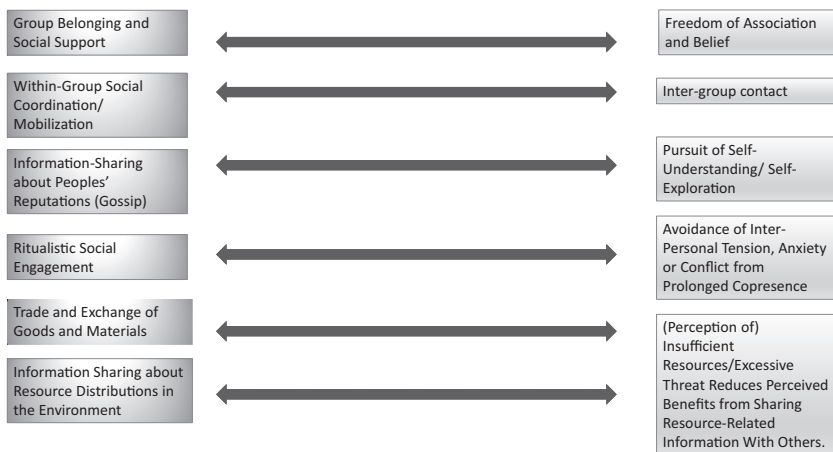


Figure 1.3 Symmetrical Motivations Driving Fusion \leftrightarrow Fission Oscillation

free to do this; foragers maintain a high degree of autonomy. Bands, then, are sub-unit aggregations of individuals pursuing a wide variety of daily goals who share a superordinate tribal/ethnic identity. Home bases are where these sub-unit aggregations eat, sleep, and keep valued resources.

A forager society with a large population might have dozens of band sub-units on any given day, and many home base camps. Meanwhile, a very small forager society might segment into only one or two bands on a given day and sleep in a single home base camp. The degree of group segmentation depends on group size, and group size is largely dependent on resource stability—settled or semi-settled foragers near reliable resource patches tend to grow larger, and segment into more sub-units. Interestingly, if a settled forager society has plentiful access to a resource stream—perhaps, literally, a stream of fish—they might willingly allow others from more resource-disadvantaged tribes to immigrate (temporarily or permanently) in order to avoid conflict. This was the case with Native American groups on the Northwest Coast: some bands had settled near large, rushing streams filled with salmon, while others camped along smaller streams that were less reliable food sources (Kelly, 2016). To avoid risking attack or invasion from these more food-deprived groups, large feasts were held where anyone from the surrounding locale could find food in hard times.

Of course, increases in group size can lead to social tensions—this is one of the central checks on the length or acute intensity of fusion state (Kelly, 2013). If a large group aggregates and interacts at a high rate for an extended period, tiffs, disputes and frustrations will reliably emerge and these can potentially reduce group cohesion. For these reasons, while fused states can facilitate the transfer of information by increasing rates of interaction, the longer and more intense the fused state, the greater the potential for interpersonal squabbles and peer-pressure regarding what one “should” believe and what norms or practices “should” be followed.

Trade was a critically important component of the fission-fusion of foragers, as it is for the rest of us. Foragers create complex emotional and instrumental alliances with members of their own tribe/ethnicity and with other tribes/ethnicities. They intermarry between groups, trade between groups, hold celebrations and ceremonies and festivals as a consortium and create coalitions during conflicts. While foragers typically have a band or tribe identity, who “counts” as a band or tribe member shifts fluidly as alliances shift and as the wider social network is recombined and replenished.

Trade is central to the foraging economy, and the information shared between tribes can be useful for hunting, foraging, tool-making techniques and keeping safe from threatening surrounding groups and predators. Trade often occurs across long distances, though obviously, the longer the distance, the less frequent are interactions. Still, anthropological evidence shows that contemporary foragers can maintain trade relationships with other communities over sixty miles away (Brooks et al., 2018). Typically,

however, relationships with exchange partners occur within a 10–15 mile radius annually. It is plausible that this range of trade and exchange in forager groups would have gotten larger across hominin species, tracking the expansion of the neocortex and capacity for abstract, flexible construals of “fictive kin” relatedness. An important caveat is that, if one forager group has significantly greater access to resources than another, trade benefits might become asymmetrical over time, leading to an eventual dissolution of the trade relationship.

Still, even in the context of less frequent trade relationships, new experiences, behaviors, and ideas/mythologies can circulate, at least to some degree, across the myriad home bases each night in campfire discussions. The next day, this information might spread throughout the band or throughout the tribe/ethnic group. For more settled or semi-settled foragers, while their existence was more confined to a specific geographic area, their trade relationships with other groups might span miles, and groups that were particularly comfortable regarding resources might hold feasts or potlucks to share with others in order to avoid conflict. During these feasts and potlucks, information and experiences were shared as well, providing potentially survival-relevant informational cross-pollination between groups. And, even in the darker scenario of outright conflict, the absorption of slaves or captives (more common in large settled horticultural and agrarian societies) might amount to a steady exposure to new beliefs or behaviors.

Kelly (2013) defines forager mobility using the following five dimensions: (1) number of residential moves per year; (2) average distance moved between residential camps; (3) total distance moved per year between residential camps; (4) total area covered per year; and (5) the average length of deliberation/planning for the move. These forms of mobility are key underlying dimensions of the fission-fusion in a forager society. A greater number of residential moves over long distances exposes foragers to potentially more trading partners and more new experiences, all of which can stimulate innovation and creativity. Furthermore, time spent deliberating over these moves, the length of these moves, the area within which these moves will take place, and so on, all constitute a fused context of semi-democratic group discussion. Because foragers lack centralized decision makers—foragers do not have “presidents” or “leaders” per se, just people of varying levels of status/prestige—decisions about group mobility would tend to be made by consensus and committee albeit with outsized influence from elders and others with high status (Boehm, 1999; 2012).

But what happens when foragers fission to such a degree that the collectively shared tribal/ethnic identity is no longer salient or meaningful? Sometimes, competition over resources becomes so fierce, or diseases spread so quickly, or specific sub-units become so despotic that forager groups decide to disband permanently. Moffett (2019), drawing on contemporary

anthropological work as well as on zoological observations of chimpanzees, concludes that forager societies do not “collapse” in the sense of individuals scattering out in all directions, but, rather, just segment off into sub-groups which become the more salient bases of peoples’ core identities. Forager societies, and societies in general (see Tainter, 1988; Diamond, 2005), splinter into factions, in an almost fractal manner, during periods of collapse. Commitment to these sub-units or sub-cultures grows as the legitimacy of the broader tribal/ethnic/national identity wains. Instead of being loyal to the norms and rules associated with a superordinate identity, people restrict their loyalty and interaction to a subset and come to identify with that sub-unit’s norms and rules. More general tribal/ethnic/national symbols and totems become replaced with more idiosyncratic sub-group symbols and totems.

I would like to make one final, preliminary, point about fission-fusion dynamics in human foraging societies, which is applicable to societies in general: fission-fusion is a key driver of creativity and innovation in groups. I have alluded to this point, but it is worth making it more explicit because technological (particularly, infrastructural) innovation will be a crucially important issue discussed a bit later in this book.

Generally, people in groups follow what has been called a “law of least effort,” “path of least resistance” or “herd mentality,” meaning that people tend to conform to group ideas and behaviors and reproduce them more or less unreflectively as a means to demonstrate their loyalty/commitment to the group, and to maintain a positive group reputation (Zipf, 1949; Boserup, 1965; Raafat et al., 2009). Specifically, humans appear to imitate one another in interactions, more so than other primates, and even when the behavior being mimicked does not make any rational sense (Keupp et al., 2013; Stengelin et al., 2020). Humans will also endorse norms they do not agree with just to elicit the approval (or avoid disapproval) from others (Willer et al., 2009) The downside is, obviously, that group ideas and behaviors can become rigid and unchanging, and this is risky in an always-changing social and natural environment.

Periods of fissioning can help people begin to forget or reflect on established ideas and behaviors. Social distance from others can also spur new ideas, whether these new ideas are truly novel, or just confused misremembered re-combinations. Errors of memory, along with time apart from other group members, then, can introduce variation or “mutation” into cultural ideas and practices (Moffett, 2019).

Indeed, fissioned periods might be enjoyable to people because they allow for a greater degree of experiential individualism, or experiences shared only by self or by self and a few other select group members. People (if not all animals) appear to have an innate desire for newness, for example, in food, art, or recreation (González-Cutre et al., 2016) which might deviate from the superordinate group norm or habit. This motivation to

experience and think in (perhaps even only slightly) novel ways can both motivate relative fission states and, again, introduce variation into established cultural ideas and practices when groups fuse again.

It is equally important to consider how states of relative fusion can spark creativity and novelty, especially when people aggregate after having been dispersed for a period of time. It feels good to see familiar, liked, people again, or to meet and form a group with new people—social aggregation is emotionally “effervescent,” and confers emotional energy (Durkheim [1912]2008; Collins, 2004). This concept of energy need not be understood in some metaphoric sense—it is literally central nervous system-driven metabolic energy that is expended and focused on the collective. There are many reasons why being around others can be energizing and creativity-enhancing—nobody quite knows what others will say, which introduces an enjoyable degree of unpredictability, and everyone is interested in being seen as important or useful which can lead to interesting conversations. It is, in various ways, possible to measure this “energy”: research has shown that the presence of another person tends to increase the speed, but not necessarily accuracy, of behavioral tasks (and the same is true in other mammals, such as rats, see Sekiguchi and Hata, 2019).

Finally, but no less important, forager camps near border areas separating different tribes/ethnicities might be more creative and innovative (Moffett, 2019). It seems that innovation and creativity emerges in boundary/border zones in any society, not just foraging societies (e.g., Turchin, 2016). The logic is that boundary/border zones are areas where individuals with different identities and experiences continuously pass through—these zones are spaces of increased cultural variance. As a result, when trading or information posts form along such boundaries to aid travelers, an *open* system of fission-fusion (where people are freely moving in and out) is formed. A relatively high rate of oscillation between fission-fusion states, and the open-system of continuous travelers passing through, is an optimal context for the spread and integration of new ideas and behaviors. Moreover, when one is not “officially” located within a cultural milieu, but rather lives in the space between cultural boundaries, one is less beholden to the norms, roles, and identities common in any given milieu. Theoretically, inhabiting or spending time in a space between societal boundaries might therefore be conducive to the flexible construction of new identities, beliefs, and behaviors.

“Cultural Evolution,” Descriptively

Humans' closest living *genetic* relatives, chimpanzees, tend to socialize with one another in temporary, fluid, couplings of between five and ten individuals embedded within communities of around 20–60 individuals (Meder, 2007). Sometimes, these communities are smaller, sometimes they are larger. For example, one chimp community along the Lomako river in the Congo was found to contain only about ten individuals, while another chimp community in Kibale, Uganda, was found to be unusually large, containing 140 individuals (Meder, 2007).

Humans' closest living *social-structural* relative, ants, live in societies that vary in size even more widely (Wilson, 1971). For example, the species *Dinoponera*, the largest ant on Earth at around 1.5 inches long, lives in communities of only a few individuals whereas the species *Eciton*, colloquially called “army ants” on account of their colonizing raids for food, live in societies of hundreds of thousands of individuals (Fonseca, 1993). Some species of ant have coevolved with certain plants, called Myrmecophytes, and this enables the ants to draw resources from, and nest inside, the plant structure. The resources made available by this plant structure (a form of energy infrastructure) can allow ant societies to become truly massive—the species *Pseudomyrmex*, who farm sugars and proteins from Acacia trees, have been observed living in societies of 1.8–3.6 million individuals (Janzen, 1973). Although these observed numbers are huge, the potential size of such a colony is “almost infinite,” depending on the prevalence of Acacia trees and how broadly “colony” is defined (Janzen, 1973, p. 745).

The larger an ant colony gets, the more workers begin to specialize in various tasks (Amador-Vargas et al., 2015). This is due to the costs associated with task-switching when there are many individuals who can work; it is more efficient to specialize in one area of activity, so long as there are enough other individuals to specialize in different but complimentary tasks, than it is for each individual to attempt to complete *all* necessary tasks (Jeanson, 2019). This division of labor involves certain individuals specializing in patrolling and defense, food gathering, food storage, nest-making, waste management, and so on. However, like humans, ants typically do not

work any harder than they need to, and much of their day is spent napping or wandering around leisurely (Hölldobler and Wilson, 1990).

It could be argued that my decision to highlight ants as humans' closest social-structure relative is somewhat arbitrary. Honeybees, for example, can also live in large colonies ("hives") of 10,000 individuals (Dornhaus et al., 2006). Termites, perhaps especially in urban areas, can live in societies of more than one million individuals (Haagsma and Rust, 1995; Porter and Hawkins, 2001). Regardless of the social insect that we want to use as a comparison, the point is this: Humans are chimp-like in their emotionality and intelligence, and antlike (or bee-like, or termite-like) in their complex division of labor and massive societies. Chimps do not have complex divisions of labor and do not live in societies of thousands, tens of thousands or beyond. And, obviously, ants (and other social insects) are not as emotional or as intelligent as chimps. Humans are the phase-shifting blend of these two strategies—the intelligent, emotional ape capable of living in large colonies constituted by a complex division of labor.

Humans have not always lived in megasocieties. Human populations have grown nearly six orders of magnitude over the past 10,000–12,000 years: according to the anthropological research, very large human forager groups might contain around 1,500 people, whereas the population of China at the time of this writing is 1.39 billion people, and the population of India is 1.35 billion people. The populations of the largest human societies today are thus larger than the largest colony of any (known) social insect. This population growth among humans was generated by changes in the time and resources dedicated to plant cultivation, which generated surpluses of food, which enabled full-time leadership and occupational specialization, which resulted in the construction of institutions beyond the small tribal units of hunter-gatherers.

We now turn to a description of these societal shifts over the last 12,000 years.

2.1.1 From Nomadic Foraging to Sedentary Farming

People's shift from a nomadic lifestyle of foraging and hunting to a more sedentary lifestyle of plant cultivation changed the course of human history, but it did not happen suddenly or with any linearity. No, widespread sedentary farming villages emerged slowly, incrementally. There is no dichotomy between some "era of foraging" and an "era of farming": mammoth hunters in the Upper Paleolithic, prolific foragers that they were, also built semi-permanent stone houses and countless peoples across history have lived in semi-permanent fishing outposts near streams and rivers even as they maintained a wide foraging range inland (Smil, 2017). Thus, any usage of the term "transition" when speaking about one societal

“form” relative to another should be understood as a long, non-linear, easily reversed, process of increased fusion at a new level of analysis.

Flannery and Marcus (2012) provide a helpful example of how such “transitions” might have occurred, when they occurred. They draw from contemporary ethnographic accounts of the //Gana, a society of foragers who lived at the edge of the Kalahari desert next to another society, the !Kung, who had begun cultivating various crops such as beans and melons as well as domesticated goats. Following the !Kung’s lead, the //Gana began their own project of plant cultivation and animal domestication in the 1960s.

By the late 1970s, several changes in //Gana society were noticeable: The //Gana (1) stopped living nomadically during periods of heavy rain; (2) once settled, families attempted to preserve and store their meat more often and share it less often; (3) some families were more successful at cultivating plants and others grew more tolerant over time of this differential accumulation; (4) more successful farming families leveraged their crops so as to trade for valuable material items; (5) men began offering payments (“bridewealth”) to their bride’s family in exchange for the opportunity to marry; and (6) older men with pre-existing status on account of their experiences hunting or in warfare leveraged successes in plant cultivation to garner two or three wives while asserting themselves as “big men” or chiefs capable of speaking on behalf of the entire group.

The //Gana and !Kung are just one, very contemporary example. Many others might be cited, although the further back in time we go, the more we must rely on inferences from the archaeological record. In general, the longer a group spent settled, tending gardens, the harder it was to return to a life of nomadic foraging. People not only accumulated land and goods but also children, making a mobile life more difficult.

Farming was practical, not inevitable. If the effort devoted to plant cultivation seemed excessive, perhaps because soil quality was low or perhaps because wild fruits, nuts and tubers were easily accessible, then plant cultivation would be halted for a time. Likewise, if wild game animals were low in number or if wild vegetation was picked clean, a relatively more nomadic group might settle for a period and cultivate small gardens. Or, in many cases, nomadic foragers lived in proximity to more settled plant-cultivating societies, and often, a mutually beneficial interdependent synergy emerged (Headland et al., 1989). For example, foragers, owing to their larger roaming range, accrued rare goods, materials, and valued fruits more often than those in settled villages. On the other hand, those in settled villages offered larger markets in addition to relatively greater resource stability and surplus compared to neighboring foragers. And, at any point, if village or city life seemed inconvenient or impossible, people could scatter to the surrounding countryside to resume their lives as hunters, foragers and/or pastoralists (Scott, 2017).

The most obvious difference between a hunter-gatherer group and a farming village is that people living in a village full-time tend to have a restricted roaming range, a monotonous but stable diet, relatively greater degree of resource accumulation and “big men”/chiefs making decisions on behalf of larger numbers of people. Chiefs represent an emergent decision-making unit, that is, a person or committee imbued with the status and power to orient behavior (for example, which trade relationships are officially encouraged vs. discouraged) and belief (for example, how tribal or village mythology is to be formally interpreted) among increasingly large numbers of people.

Put simply, people were prone to settling down where they felt safe enough, and protected enough, to cultivate large amounts of food. Their safety, and protection of their crops, was promised by a chief (or a counsel of chiefs), who expected some degree of loyalty and willingness to pay some form of taxation or tribute. And, the longer people settled in these sorts of arrangements, the more goods (and children!) they accumulated, reducing their capacity for mobile nomadism outside the confines of the village. Sedentary farming life has obvious liabilities, though: corruption, resource-hoarding, accelerating inter-societal conflict (because people become more territorial on account of roaming less), nepotism and so on. When leadership failed to reduce and regulate conflict, protect people’s crops, or tax within reasonable limits, people would simply pack up and head back to the hinterlands to grow smaller, more personalized, gardens or, perhaps, return to life as a nomadic forager (Flannery and Marcus, 2012). People dispersed from their sedentary farming villages for all kinds of other reasons as well, such as the occasional desperate need to flee to avoid diseases and plague outbreaks, which were quite common on account of people living densely among one another.

Also, I should say, the term “sedentary,” as used in this book, means that as agricultural innovations accumulated and populations rose, people became more economically bound to particular stretches of land, which were taxed by whatever local leaders reigned. Life itself, of course, was very busy, so do not take “sedentary” to mean sluggish or lazy.

The widespread adoption of a sedentary farming lifestyle might have become easier beginning around 10,000–15,000 years ago (Richerson et al., 2001). It would have been very difficult to reliably grow crops in abundance when the weather was very cold and carbon dioxide levels were too low, as they were in the late Paleolithic when modern humans emerged from the hominin line. Beginning around 15,000 BCE, the globe began transitioning out of the Ice Age which had characterized it for many millennia before. The Middle East and West Asian regions of the world were becoming more humid, sunnier, and carbon dioxide levels were rising. Specifically, it appears that atmospheric carbon dioxide levels rose by about 50% over a few thousand years, from 180 to 280 parts per million (Flannery and Marcus, 2012).

Wild barley, emmer wheat, and other nutritious plants—fairly easy for humans to grow at scale—began emerging naturally at high altitudes during this period.

The available evidence suggests that widespread domestication of beans, wheat and barley first began in a stretch of land known as the “Hilly Flanks” or “Fertile Crescent.” This land curved, “up through the Jordan Valley to the Turkish border and then back down along the Iraq-Iran frontier,” (Morris, 2015, p. 47; Vavilow, 1992). This was an optimal stretch of land for farming, owing to the amount of rainfall, proximity to the Mediterranean Sea, Red Sea and Persian Gulf, and because the Tigris and Euphrates rivers snaked through the land allowing for riverside settlements, and easier communication and transportation by boat. The concerted cultivation of large amounts of grain and ease of access to water led to regional populations of tens and hundreds of thousands of people (Morris, 2015).

Horticulture (small-scale farming) and agriculture (larger-scale farming and animal domestication) emerged independently across continents. Concerted plant cultivation tended to develop near large bodies of water, where climate was optimal, and where edible, easily domesticable plants were abundant (Diamond, 1998). For example, around 7,000–10,000 years ago, people began domesticating millet and rice in China along the Yangtze and Yellow Rivers. People started domesticating barley, wheat, and beans about 7,000–10,000 years ago in modern-day India along the Ganges and Indus Rivers, sandwiched between the Arabian Sea and the Bay of Bengal. Squash, corn, and Andean potatoes were being domesticated in modern-day Bolivia, Ecuador and Peru along the Pacific Ocean by around 7,000–10,000 years ago. Early farming typically involved between 1 and 3 years of cultivation followed by fallow periods of a decade or longer (Smil, 2017). Natural vegetation was burned off, and gardens of varying sizes were fenced in close to settlements to facilitate the monitoring (and defense) of crops. Crop rotation practices were also slowly adopted, such as planting cereals one year and beans the next, which helped replenish soil nutrients (Morris, 2015). Other practices involved selectively re-planting only the largest seeds or only tending plants that would grow in dense bunches.

The earliest origin of concerted plant cultivation, however, seems to be during the “Ubaid 1–2 period,” beginning around 5400 BCE, when farming practices became wide-scale and systematic (McIntosh, 2017). This period is marked by the establishment of several farming communities in Southern Mesopotamia, which had begun experimenting with simple systems of irrigation in order to grow crops at scale. In a little over a thousand years, beginning around 4,100 BCE, the “Early Uruk” period begins with a flourishing of settlements in Babylonia that would eventually use plows, threshing sledges for separating grain kernels from straw,

as well as wheels and domesticated animals for the transportation of goods and people (McIntosh, 2017).

Farming brought significant net returns in caloric energy. It seems that the dependence on grains in farming societies around the world—from rice to millet to barley to wheat to corn kernels—was due to their (1) high yields; (2) high energy density, including high amounts of carbohydrates and (especially in wheat) proteins; and (3) their fairly low levels of moisture, which rendered them ideal for prolonged storage (Smil, 2017). In a review of the research, Smil (2017) estimates 11–15-fold net energy returns for grain crops and anywhere from 20–70 fold returns for bananas, corn, and some root plants and legumes. These net energy returns would have been easily noticeable in early farming societies—for example, the cultivation of corn in South America would have taken around 600–1,000 hours of labor from seeding to consumption, but it would have provided 25–40 fold energy returns (Smil, 2017). In South East Asia, the cultivation of rice might have taken 2,800–3,200 total hours of labor, but this labor would have yielded 15–20-fold returns in consumable energy. More mouths could be fed than ever before, leading to more children being born and reared but also to more full-time elites, beginning with village chiefs, who could now focus on political, economic or religious matters full time.

Thus, the incentives driving people to adopt a sedentary farming lifestyle would have been obvious, just as obvious, in fact, as the downsides of increasing inequality, worsening disease conditions (resulting from sedentism combined with poor sanitation) and, often unconsidered, declining dietary variation (Smil, 2017). People in farming villages were eating comparatively less wild game meat and fewer fruits or nuts. Yet, what they had lost in dietary breadth and nutrition, they had gained in grain surplus and food stability (Cohen and Armelagos, 1984).

Given the large population densities that grew in response to the large caloric returns afforded by plant and animal cultivation, social life and economic exchanges became more rigid and more planned. With fewer people, movement and ritual can be more spontaneous, but more advanced planning is required when coordinating large masses of people. Indeed, anthropologists find that nomadic hunter-gatherers often hold rituals, feasts and social gatherings whenever resources permit, but that sedentary agriculturalists adhere to a more scheduled calendar of rituals and social events (Flannery and Marcus, 2012). Life in a farming village is, then, more structured and less spontaneous, and this, in addition to rising inequality and declining dietary breadth, is another reason why some groups preferred to maintain their lives as foragers. Still, the pull of a stable, if boringly predictable, food supply lured many to settle into villages.

The larger and more complex a farming village (or mass network of villages) became, the greater need there was for infrastructure, defined here

as material structures which extract, process or distribute energy throughout a society. Small families need tools and seeds to tend their own gardens, but to grow a farming society into the thousands, tens of thousands and beyond, people must have access to “collective tools” which reliably funnel resources like veins throughout a body. In farming societies, especially large ones, key infrastructures took the form of irrigation canals, food storage buildings, cleared roads and sloped, terraced fields which helped partition farm land in hilly geographic regions (Smil, 2017). An individual with personal access to water does not necessarily require a canal; an individual with a well-trodden path around their home does not necessarily need a road. But, to scale population and commerce to new heights, a collectively funded (albeit coercively funded via taxation) set of infrastructures are needed.

The more time people spent in increasingly dense settlements, the more they began to specialize their talents, spending less and less of their day hunting and more and more of their day making things like furs and skins from animal hides, tools for farming, and bowls using pottery wheels. By the 5th century BCE, the archaeological record begins to reveal tell-tale signs of sedentism and growing craft specialty—stone-walled houses, large storage containers, stones for grinding seeds, and ornate pottery (Kelly, 2016). By the Late Uruk period in the 4th century BCE, small (by our standards) cities have emerged and occupational specialization is flourishing—people were now being sorted into various jobs from scribes to messengers to carpenters, cooks, and potters (Flannery and Marcus, 2012). And, while there is not yet anything like a “middle class”—most people remained poor farmers—slowly growing occupational specialization facilitated the emergence of unprecedented economic markets connecting Mesopotamian cities with one another.

The domestication of animals, in particular goats, sheep, cattle and pigs, appears to have emerged around 9,000–10,500 years ago and involved selective breeding and rearing for tameness (Smil, 2017). Domesticated animals could then be farmed for their meat or used as mechanisms for converting grass into milk. In ancient Mesopotamia, animals were domesticated on a large scale and also by individual households. Oxen were raised to plow farmland, cows were raised for their meat and milk, pigs were raised as a source of food (especially fat), sheep were raised for their wool, ducks and geese were raised for their meat and eggs, fish were used for food, goats were raised for meat and milk (and, along with human children, sacrificed at temples as offerings for the “gods”), and most all animal skins were used to make leather (McIntosh, 2017). However, although animal domestication was widespread in Mesopotamia and across farming societies, it is comparatively less common than the practice of plant domestication and cultivation. For example, the Inca and the Maya, two quite large farming societies with populations into the millions,

apparently, did not domesticate draft animals (Smil, 2017). It is important to keep in mind that, although usable for food and labor, animals also *require* quite a great deal of food (hay, ruffage) and labor (pens, coops, stables, medical care) themselves. Some societies, like the Inca and Maya seem to have relied more on slave and indentured human labor (“*corvée*” labor) and relatively less on the labor of draft animals.

Although rarely discussed by analysts, the possibility that domesticated livestock also served to provide occasional companionship is likely, if not always well documented. When precipitation, soil quality, or climate were poor, some people pursued pastoralism, a subsistence strategy that is essentially a midpoint between nomadic foraging and sedentary farming. Pastoralists would domesticate and selectively breed livestock, and live off of the meat or milk of the animals, but would not maintain a permanent, sedentary residence in any one place. Pastoralism requires relatively little labor—so long as grass is in abundance, a herd of 80 cattle could provide a food source for at least five or six people—but given that pastoralists do not often form permanent, defensible villages, their valued resource is hard to defend from surrounding societies interested in conquest or theft (Smil, 2017).

Agricultural techniques related to farming and animal domestication were sometimes picked up by those living as foragers out in the hinterlands who, at times, would come into the villages to sell exotic skins or shells. These techniques were also brought to the hinterlands more directly if a village collapsed as a result of conquest or an outbreak of disease, leading people to take off for the countryside. Thus, the *fusion* of nomadic foragers with village-dwellers, via a shared regional market for goods, helped to haphazardly disseminate innovations in energy extraction from plant and animals, while the *fissioning* of farming villages (under conditions of extreme stress, instability or collapse) dispersed people into the countryside and back to a nomadic mode of life, albeit equipped with the memories and practices of village life (Smil, 2017).

Morris (2015) points out that if the resident of an ancient farming village decided to walk in a straight line out of town, they would not eventually cross a boundary marking a sudden transition to land roamed by foragers. Rather, as they left their village, they would encounter people who farm less and less while foraging more and more. Food, materials and ideas would flow back and forth, from foragers on the outskirts of town to the village center and back again *ad infinitum*. The farming-nomadic foraging transition was a spectrum of change, not a transition in the sense of a sudden threshold shift where all individuals who were former foragers became full-time farmers. As I have mentioned, inhabitants of a sedentary village might decide to pack up and move out to live more nomadically for a period, perhaps owing to the spread of disease or in response to frequent warfare (Karlen, 1995). The end of the last Ice Age and the

warming of the climate merely afforded foragers more opportunities to benefit from strategies of plant cultivation, animal domestication and the (relatively) bustling markets of village life, should they choose to.

The more plant and animal resources that are cultivated, the more populations can swell in size. Unlike nomadic foragers, early farming societies, on account of their growing populations, had increasingly distinct social strata—families within a society became grouped into separate lineages, which were themselves grouped into clans. Many farming societies were comprised of two large clans (e.g., the “Summer” and “Winter” clans of the San Juan Pueblo), but for those composed of more than two clans, anthropologists use the term “phratries,” (from the Greek term for “group of clans”) (Flannery and Marcus, 2012). These new superordinate groupings helped people coordinate with one another, and share a sense of identity with one another, in societies rapidly inflating in size. However, these superordinate groups were rarely permanent. If one clan, or one family lineage within a clan, felt that they were being treated unfairly by others, they would pick up and leave for another village, or establish a new village themselves. The rise of plant and animal cultivation thus afforded a new level of fusion (into family lineages, clans or phratries) and a new level of fissioning (of dispersing family lineages, clans or phratries). Eventually fissioned lineages, clans, and phratries became sufficiently isolated from the language, beliefs, and practices of the groups they left behind, becoming their own separate grouping.

However, there was a *significant* impediment to nomadic foragers’ willingness to adopt a lifestyle of full-time plant and animal cultivation—rising inequality. Sedentary farming economies gave rise to the first substantial forms of inequality in human societies.

Rising inequality in resources and in social influence resulted from people’s newfound ability to hoard goods, owing to surplus cultivation and expanded trade, along with the attempts of more successful families to canalize their wealth to subsequent generations. And, it must be underscored that this agricultural surplus, especially the sort of taxable surplus beginning in early cities and states, was coercively driven. Once a peasantry has their subsistence needs met, they often stop concerning themselves with further agricultural production (Scott, 2017). If production is to continue, a ruling class must have the capacity to force (by threat of violence or land annexation) further productivity from farmers so as to tax the crop yields enough to sustain themselves. It would not be incorrect to call the emergence of an elite, bureaucratic, class a sort of asymmetric parasitic mutualism—chiefs, nobles, clerics, and militia get food and other vital resources; the peasant farmers get (some degree of) protection and (some degree of) access to bustling urban markets.

Given that the accumulation of cultivated plants, stored food and hoarded material goods (including exotic shells, feathers, weapons, and other

valuables) tended to be passed on to each successive generation within family lines, it began to appear as though certain families were just unusually blessed with good fortune. People's intuition that what exists today must have always existed, or must exist for good reason, (the "existence bias," see Eidelman et al., 2009; Eidelman et al., 2010), would have made the intergenerational accumulation of wealth among some families seem less controversial over time—some families would just be essentialized as "better people" or as having "better ancestral ties" or some other essence that explained the inequities in resources. Even setting aside this intuition, though, the fact of differential accumulation, along with the sedentary lifestyle that motivated such accumulation, appears to have led to the slow erosion of the egalitarian ethos so distinctive to nomadic hunter-gatherers.

It was not sedentary, full-time farming, by itself, that led to increases in inequality and concentrations of power among formerly nomadic hunter-gatherers. Rather, it was a combination of differential accumulation and hoarding of resources *in tandem with* a developing cosmology legitimating this differential accumulation of social influence and resources. The cosmologies and religious myths of farming societies tended to be more accepting of power and resource differences between individuals and sub-groups compared to the myths of foraging societies. These inequality-legitimizing myths, developed by nascent religious and political entrepreneurs, helped to construe inequality as required, imposed, necessary.

For example, people living in the mountains of New Guinea symbolically represented their increasing focus on cultivating crops and storing goods (like sweet potatoes, sago, and yams) by re-interpreting their creation myth such that the founding spiritual ancestors were said to be responsible for both guiding the practice of gardening and for the differentially successful harvests of some families over others (Flannery and Marcus, 2012). This cosmology co-developed with greater hoarding of food and other goods, rising bride-prices and a relatively greater jostling for social status among families of certain lineages within certain clans. Generosity was still highly valued and the degree of coercive influence held by even the most prominent people or families was minimal, but the benefits of prestige and influence were beginning to converge in some families relative to others and always justified implicitly by emerging intuitions that, perhaps, the ancestors had just conferred greater wisdom and ability to some over others. It is possible that families in many cases slowly built on an initial lead borne entirely of luck; perhaps their little plot of land happened to be naturally better fertilized or some other stroke of luck. Nevertheless, the inequality-legitimizing cosmology learned from others served to tamp down and rationalize the outrage people might otherwise feel.

Perhaps the most obvious form of inequality in early farming villages was the emergence of "big men" (i.e., chiefs). So-called "big men" were

not necessarily physically large men, but, rather, men who were especially prominent (and sometimes coercive) in early farming societies. Where only one big man/chief exerted wide influence, groups tended to be pretty small, only in the hundreds (though, in curvilinear fashion, very large agrarian states would eventually produce somewhat of a return to the single-chief model in the form of an exalted king). When, eventually, societies grew into the tens of thousands, regionally nested hierarchies of chiefs emerged. These hierarchies of chiefs competed with one another for regional control, and in doing so, they often formed cooperative alliances with one another to pursue plans for conquest and expansion.

Chiefs were not only coercive, though, and it seems that coercion might not have even been their main means of establishing and maintaining influence over others. Since their earliest emergence, chiefs served as “ideal types” or models for their societies regarding some valued skill or capacity (Sahlins, 1963). Typically, chiefs achieved their influence for one or more of the following three reasons. First, they might encourage their wives, friends and other members of their extended families to help them develop a large surplus of goods, which could then be shared at tribal or intertribal potlucks and feasts. Although many people would have contributed crops and meat to these potlucks, it was the chief (or council of chiefs) who would have enjoyed the social network centrality necessary to ensure a coordinated accumulation of goods. Consequently, it is likely that chiefs took much of the credit when festivities turned out well. According to Kelly (2016):

“When [an] ambitious man held a [potluck] for another village, he was communicating to the guests just how many people stood with him. The more goods he has, the more power he possessed. The not-so-subtle message was ‘Look how much we can give away and it does us no harm. Don’t even think about messing with us, because we can crush you. Now, let’s be friends.’ Such feasts were probably an integral part of early village life...The need to produce food for those feasts might even have been a stimulus for agriculture, since more food makes for a more impressive feast...feasts [sponsored by chiefs of different villages] allowed them to judge each other’s power. This created a new level of cooperation, albeit one tainted by underlying competition. The two often go hand in hand.”

(Kelly, 2016, pp. 74–75)

Another common strategy used by aspiring chiefs to achieve prominence was to lead raids of nearby tribes in order to steal their livestock, crops or to take slaves. This might have been valued, to some extent, because of the riches and food gained, but it comes with the obvious downside of possible retaliation. Developing a reputation for constant raiding would have also

ruled out the possibility of forming trade relationships with other groups, who might reasonably expect to be exploited or attacked.

A third strategy was to be more entrepreneurial, and to develop and maintain trade contacts with people in more distant tribes so as to acquire rare materials such as exotic bird feathers, aromatic oils, pearls or shells (Flannery and Marcus, 2012). Not only were these rare items valued in themselves, but they could also serve as useful bargaining chips or valued gifts for members of one's own village, or to assuage disputes between villages. The development of trade relationships also gave aspiring chiefs an advantage when negotiating with hostile outside groups who might think twice about raiding a village so well-networked with others.

Thus, while chiefs could be coercive, their ultimate authority typically rested not in their bloodline or capacity for brutality, but rather in their village's perception of their generosity, willingness to sacrifice, and reasonableness. This is why potlucks and the ability to foster and maintain village-beneficial trade relationships were so important to the status of chiefs. Chiefs also commonly reserved areas in their community to be used as "debate spaces" where residents and other chiefs could discuss important issues of the day as they related to the village's leadership. Consider the village of Avatip in New Guinea, comprising some 1,600 people living along the Sepik River. Below is a description of how leaders of two sub-clans communicated with one another over the subject of clan authority:

"Here, during the 1970s, rival sub-clans debated the ownership of sacred ancestral names... The Maliyah sub-clan hoped to monopolize all sacred names, making it Avatip's de facto elite... The men from [the] two sub-clans faced each other across a vine boundary. Each sub-clan used an overturned canoe as a drum; each erected a series of sticks, spears and arrows to represent totemic ancestors. The debaters held bundles of magical cordyline leaves, throwing one leaf to the ground to drive home each point."

(Flannery and Marcus, 2012, pp. 190)

Chiefs were influential, but they were also relatively uncommon. Some contemporary anthropological accounts suggest that early farming villages might have been composed of around 15% "rubbish men" (i.e., never-married errand runners for chiefs, considered "losers" by most), 70% "ordinary men" (i.e., married men minimally involved in trade) and 15% "Big Men," (i.e., those with two or three wives, very successful in trade, and in control of most of the village's valuable items and food) (Flannery and Marcus, 2012). While chiefs' status was not often considered inherited *per se*, there were definitely accrued inter-generational advantages because chiefs could help their children cultivate the skills and relationships necessary to assume their own positions of prestige when they grew older.

In a sample of chiefs from the New Guinea highlands, for example, Strathern (1971) found that over half (56%) had had fathers who were also chiefs, and the likelihood of having a father who was a chief increased the more prestigious the father had been (or the more prestigious the father's clan). Because of their network centrality and influence on local political and economic decision making, the death of a chief would be devastating for a village and often led to collapse—not unlike the aimlessness and colony-collapse observed when an ant colony loses its queen (Moffett, 2019). The loss of a chief meant the loss of an epicenter of trade, negotiation/conflict resolution, economic direction and myth-making.

It is not that inequality was utterly absent among nomadic foragers—certainly, some are well-known as better hunters or artists or teachers or healers or myth-makers than others. Moreover, prestige is often attained among nomadic foragers in ways similar to how chiefs attain prestige—via generosity and fostering trade relationships. Rather, the important differences between societies reliant on nomadic foraging and those reliant on full-time plant and animal cultivation relate to population size, density, and the hoarding of food and resources which lead to more *visible* and more *intensive* (by degree) levels of inequality between individuals and family lineages.

Nomadic foragers live in very low-density social environments. If we divide the size of the typical forager group in a region by the total amount of surrounding land, we'd get an average forager population density of perhaps one person per square mile or one person per ten square miles in particularly resource-deprived environments (Morris, 2015). By contrast, farming societies typically have densities of about ten people per square mile—a tenfold increase¹. Morris explains the population growth enabled by agriculture as follows:

“...no ice-age forager ever saw more than a few hundred people at one time, and even that would only have been when bands gathered together for a few days out of the year. By 7000 BC, however, about a thousand people were living year-round at Çatalhöyük in what is now Turkey; soon after 3500 BC, more than ten thousand had settled at Uruk in southern Iraq; by 700 BC, Nineveh in Northern Iraq hosted a hundred thousand residents...”

(Morris, 2015, p. 54)

The larger and more dense society became, the more intergenerationally entrenched inequality became, because individuals in large villages or cities do not always know one another personally and, therefore, they must rely on collective myths, stories, or intuitions about others in order to interpret the reasons behind, and therefore the legitimacy of, their wealth. With increased population size and density, elites and their families in the

farming societies of history were often assumed to have inherited a special essence, or “mana,” that entitled them to respect and riches. As societies became larger and more abundant, the archaeological record shows even young children being buried with riches they could not possibly have attained by merit in their short lives—a clear sign that prestige and authority were being inherited instead of earned (Flannery and Marcus, 2012).

Although farming was adopted unevenly, over time, the spread of this practice was undeniable. Some 99% of people lived as nomadic foragers in 10,000 BCE, a time when only 5 million human beings roamed the globe. By 1800 CE only 1% of people lived as nomadic foragers (see Morris, 2015). Across this stretch, inequality rose as well. For example, consider estimates of GINI inequality scores across societies (see Morris, 2015; Mulder et al., 2009; Milanovic, 2011; Scheidel, 2018). GINI scores—named after the Italian statistician Corrado Gini—vary from 0 to 1, and reflect an estimate of the concentration of resources (typically, income or wealth) such that if resources are fully owned by one individual in a society, that society would have a GINI score of 1 and if resources are completely equally distributed in a society, that society would have a GINI score of 0. Of course, GINIs of 1 or 0 are just abstractions; every actual society falls somewhere in between. Analysts estimate that the average GINI coefficient for foraging societies hovers around 0.21–0.29, whereas early farming villages have an average GINI of around 0.24–0.30, a clear, if small, increasing trend. However, as farming societies grow in population and begin to rely more on plant and animal cultivation as well as forced slave labor, they begin to reach average GINI scores of 0.44–0.48 (for example, the estimated Gini of the Roman Empire—a huge, first-century CE agrarian state—was between 0.42 and 0.44).

Gender inequality was increasing, as well. In particular, farming villages and, especially, large agrarian states, are associated with women spending more time in the home tending children relative to nomadic foraging societies. Why is this? There are at least two reasons (Morris, 2015). First, relative to the nuts, tubers, fruits and meats consumed by nomadic foragers, the wheat, barley, millet, and other crops cultivated by farmers require more processing. Grasses and grains must be threshed, sifted, sieved, ground down into flour and, often, baked in order to be edible. While it is certainly the case that some nuts require more processing than others (for example, acorns contain too many tannins to be easily edible), in general, cultivated plants demand more processing effort. This effort was often delegated (however unfairly) to women because men’s relatively greater, on average, physical strength was assumed to be better suited for more physically demanding agricultural tasks such as plowing, fertilizing, and irrigating.

Second, the more sedentary people become the more time they must invest cleaning their dwellings and surroundings. A not insignificant reason why foragers are nomadic is because waste (from feces to used baskets or nets) accumulates wherever humans congregate, and the forager solution to this problem was to keep moving. This option was not as available to people in villages dedicated to plant and animal cultivation—one cannot simply or easily uproot and move their gardens or livestock. Sedentary life, then, was also an increasingly dirty, disease-filled life, especially where population density rose dramatically. Again, based on the logic that males were more useful in the fields than in the home (on account of their on average greater strength but, also, because they could not breastfeed), the tending of home—in addition to the sewing of clothes, weaving of baskets and the firing of pottery—fell disproportionately on women’s shoulders. Morris puts the point bluntly:

“The conclusion that farmers all over the world apparently reached was that men should go out to work in the fields while women stayed home to work in the house. So obvious did this decision seem, in fact, that no farming society that moved beyond horticulture ever seems to have decided anything else.”

(Morris, 2015, p. 59)

This intensifying sexual division of labor represented another strata of society, increasingly reified and increasingly transmitted with ideological justification across generations. The consequences were significant and long-lasting. In a nomadic foraging society, the number of children per woman is kept relatively low so the collective can stay mobile, and so that women can help as much as possible with foraging (a much more reliable source of food than hunting). By contrast, in a typical sedentary farming village, women have around seven children and spend “most of [their] adult life pregnant or minding small children,” (Morris, 2015, p. 59). Tending house and children kept women, for the most part, out of public life and, thus, out of the growing economy. In fact, historical records from ancient Rome (emblematic if, albeit, not an ideal comparison, since ancient Rome emerged comparatively recently and was enormous in size compared to much earlier horticultural or agricultural village-cities) indicate 0% of builders were women and that women comprised only 15% of manufacturers, 8% of salespersons, 16% of “professionals,” 27% of domestic servants, and only 3% of administrators (Saller, 2003).

Finally, we must not think about inequality only in terms of how it is lower in foraging societies and higher in horticultural and, especially agricultural, village-cities. Periods of inequality also varied within, not merely between, societies. The Kachin in the highlands of modern Myanmar, for example, are a well-documented sedentary farming society that

would cycle between periods of high inequality and periods of low inequality (Flannery and Marcus, 2012). The Kachin economy was predicated largely on burning off the existing foliage on a patch of land and allowing the ashes to re-nutrition the scorched Earth (an historically common, if inefficient, form of agriculture known as “slash and burn” agriculture). Once the land was sufficiently cleared, the Kachin cultivated a variety of crops, from rice and millet to yams and taro. Kachin farmers also domesticated cattle, pigs, and chickens. Ritual feasts arranged by chiefs from different sub-groups served to fuse these sub-groups under a superordinate village-city identity.

Kachin society might have reached several hundred thousand in population when European anthropologists began documenting their practices in the 1940s. In particular, the British anthropologist Edmund Leach (1954) described the cycling of inequality in Kachin society as taking two broad forms: *gumsa* periods where rankings of sub-groups became more explicit and *gumlao* periods where sub-groups coexisted without reference to an explicit ranking system.

Gumsa periods within Kachin society were periods when chiefs had relatively greater influence and control over others. People who were not directly related to the regional chief’s family lineage were expected to pay a tax (typically the thigh of an animal) and chiefs were expected to control all land in their region (those not related to the chief’s lineage were expected to readily concede this control). Other practices, such as the expectation that daughters from elite family lineages should be sold only to those offering the highest bride-price (usually in the form of livestock, weapons, clothing, or pottery) served to embed this inequality intergenerationally.

During these periods Kachin society was controlled by a collective of regional chiefs from prestigious family lineages. Some chiefs during *gumsa* periods might have had ruling influence over 60 small villages at a time (Flannery and Marcus, 2012). This constituted a considerable degree of centralized authority, resulting in a considerable degree of (perhaps involuntary) fusion. Such a concentration of authority is almost never observed among nomadic foraging groups. However, a society which regards entire family lineages as sacred or special will also be fomenting a great deal of conflict and jockeying for power *within* the family lineage. Generally, it seems that population size, density, and the perception of threat arising from a need to defend territory and crops motivated the formation of hierarchies of influence in order to maintain some degree of society-wide coordination. Yet, these hierarchies themselves were prone to fissioning as individuals jostled within and between family lineages for influence.

In *gumsa* periods, certain aspects of the Kachin cosmology were emphasized—such as the notion that a daughter of the gods married a human man at some point in the misty past—so as to frame the chiefs of certain lineages as being more special and beyond reproach than others. During

these periods of higher inequality, chiefs maintained two shrines in their home: a totem signaling allegiance to human ancestors and one symbolizing the sacredness of god-like ancestors. Chiefs used these two shrines to construct their identity as semi-human/semi-divine which, intentionally or unintentionally, served to entrench their supposed superiority to other society members. Lower-ranking individuals, on the other hand, kept only one shrine symbolizing connections to worldly ancestors; they could make sacrifices to lesser gods, but they were not thought worthy of a shrine symbolizing a deeper connection to high gods. In addition, during feasts, Kachin ritual norms specified that an additional animal's hind leg must be sacrificed to chiefs (and/or their extended family).

Alternatively, during periods of relatively low inequality and threat—*gumlao* periods—all family lineages were considered equally relevant to societal decision making and villages within a given territory were regarded as free to make their own decisions separate from chiefly oversight. Moreover, bride prices during *gumlao* periods were the same for all brides regardless of family lineage. In fact, during *gumlao* periods, the Kachin reduced the concentration of wealth and prestige by formally encouraging intermarriage between societal sub-groups, such that women of one lineage would be encouraged to marry men of another lineage. This made the inter-generational transfer of status and wealth within a single lineage more difficult and served to distribute societal influence across subgroups.

Equally important was a shift in expectations about deference and loyalty. In more unequal *gumsa* periods, Kachin individuals were expected to defer to those regarded as superior in lineage or rank whereas in *gumlao* periods, people were encouraged to be loyal to their own family lineage. In other words, during lower-threat periods, individuals felt free to fission a bit and relegate their time and attention to their particular family line, whereas during higher threat periods, individuals were expected to fuse into a more coordinated collective organized by hierarchies of prestigious lineages demanding deference.

Outside of perceptions of threat or instability, the full extent of the underlying reasons why Kachin society cycled between what can be called more closed system fused states of high inequality, and more open system fission states of lower inequality, are still debated (Flannery and Marcus, 2012). No doubt, there are many reasons. One further dynamic that appeared to be driving this cycling is that the Kachin formed trade relationships with nearby, much larger, societies, and formed ranks among sub-groups so as to better coordinate the resource extraction, processing and distribution of valued goods to these trade partners. For example, at one point, the Kachin formed a trade relationship with a society in close proximity, the Shan. The Shan were a much larger society that had settled along a riverbank at a much lower altitude than the Kachin. And, while the Kachin could offer the Shan numerous exotic goods from the highlands—things like jade, amber, gold, and silver—the Shan offered the Kachin

more staple goods, such as rice from their paddy fields, which grew more abundantly in the lowlands. Yet, intermarriage between Kachin and Shan families often led to status differences when Kachin men with Shan wives attempted to leverage their inter-societal network/trade ties to establish or maintain intra-societal influence. In this way, fusion in Kachin society oriented toward coordinated resource extraction and distribution was offset by some degree of in-group fissioning when Kachin men would intermarry with Shan women.

Another possibility is that debt-slavery—an obvious, and intense, form of threat—motivated a transition to *gumsa* periods among the Kachin (Flannery and Marcus, 2012). Men, for example, would sometimes go into debt if their bride's family expected a particularly large offering for their daughter. Chiefs would supply these loans, but they would expect the debt to be repaid, and if no repayment was forthcoming, the debtor would be relegated to the status of a *mayam*, or slave. Entire family lineages were sometimes understood to be debtor-slaves on account of their chronic poverty. During some *gumsa* periods, about *half* of all Kachins were debt-slaves (Leach, 1954).

Kachin society at the time Leach (1954) studied it contained as many as 300,000 people. This is a very large society, indeed, colossal by the standard of a small foraging tribe composed of 150 people, or large foraging tribe composed of 1,500 people. Yet, consider that 450,000 people lived in just the city of Ancient Rome, and some put the population closer to one million (Storey, 1997). Or consider that the Persian (Achaemenid) Empire (circa 550–340 BCE) contained a population of some 17–35 million people (Wiesehöfer, 2009). Levels of resource inequality in these sorts of megasocieties was (and is) very extreme, and seems to continue mostly unchanged until very rare, but very intense, events occur. It seems that once societies reach a certain size, only extreme circumstances, what Scheidel (2018) calls the “great levelers,” of mass high-casualty warfare, revolution, economic collapse/state failure, or plagues appear to have the force to restructure the distribution of wealth in societies.

However, with the emergence of large agricultural village-cities and then, especially, in massive agrarian empires, life was in some ways becoming safer because elites were motivated to keep their territories protected with militias lest their tax base be conquered by surrounding societies. For example, about 10–15% of foragers in a given group die as a result of some form of interpersonal violence, but this number fell to 5% during periods of the Roman Empire and Han China (Morris, 2015; see also Pinker, 2011). Granted, given raw population size differences, 5% of people in a society like Han China is still many orders of magnitude more people falling victim to violence than would be 5% of people in a forager group. Still, the proportionally higher rate of murder among foragers seems to be a result of their lack of a formal third-party mechanism (i.e.,

law, police government militias) to enforce peace when conflict occasionally *does* get out of hand. Sometimes, there are historical events which help to provide evidence for this—the collapse of the Roman Empire and other Eurasian states, for example, were associated with a doubling of the violent death rate (Morris, 2015).

Relative reductions in violence were not the only markers of growing agrarian economies. Upward mobility was also very slowly increasing (as nobles sometimes appointed commoners to bureaucratic positions of authority), economic markets were becoming more vibrant (owing to the circulation of diverse people into and out of city centers) and people’s worldviews were also becoming more cosmopolitan and, subtly, more tolerant. Tolerant because positive-sum social and economic interactions with new, unfamiliar, people were becoming a staple of life as population density rose (Wright, 2001; Pinker, 2011; Flannery and Marcus, 2012; McCloskey, 2016).

Do not take the above comments to mean that violence was becoming absent (hardly, the era of conquest had only just begun), that upward mobility suddenly became prevalent (hardly, most all people in ancient agrarian states were poor farmers or indentured laborers), that economic markets suddenly became fully realized (hardly, as no substantial middle class yet existed) or that individuals suddenly became sufficiently tolerant (again, the era of conquest had only begun). Rather, the point is that social life was beginning—just beginning—to change in profound ways compared to social life in a foraging group or social life in a small horticultural village. Shifts in social structures were beginning to have effects on people’s longevity, safety, economic opportunities, and cosmopolitanism.

We turn next to the rise of these massive agrarian empires.

“To be governed is to be watched, inspected, spied upon, directed, law-driven, numbered, regulated, enrolled, indoctrinated, preached at, controlled, checked, estimated, valued, censured, commanded, by creatures who have neither the right nor the wisdom nor the virtue to do so. To be governed is to be at every operation, at every transaction, noted, registered, counted, taxed, stamped, measured, numbered, assessed, licensed, authorized, admonished, prevented, reformed, corrected, punished.”

(attributed to Pierre-Joseph Proudhon)

2.1.2 The Rise of City-States and Kingdoms

The first agrarian kingdoms emerged *at least* 5,500 years ago in Mesopotamia, 4,500 years ago in the Indus Valley, 4,000 years ago in North China and around 2,000 years ago in South America.

The typical kingdom was composed of a ruling class of elite military, religious, administrative, and clerical professionals, led by a king—in

essence, the “big man” among “big men” or chief among chiefs—who controlled and often co-opted the labor of a large strata of land-owning farmers, peasants indebted to these farmers, and slaves (Gellner, 1983; Flannery and Marcus, 2012; Morris, 2015). King-like claims to authority appear to emerge fairly reliably once the population of a town or village grew beyond around 10,000 people (Morris, 2015). In an important sense, kingdoms are embedded, expanded versions of farming villages. Particularly large kingdoms are also marked archaeologically by their religious temples and monuments which no doubt served the purpose of elite legitimation. The existence of an entire class of slaves is also unique to kingdoms; this results from the increasing focus on conquest and land acquisition made possible by a growing army, itself a byproduct of swelling populations.

Kingdoms emerged as a consequence of entrepreneurial leaders consolidating smaller chiefdoms, via violent conquest, into single symbolically defined (and vigorously protected/defended) territories. When, inevitably, some warlords outcompeted others on the battlefield, conquered territories and peoples were integrated under centralized bureaucracies, often led by hand-picked associates of the conquering warlord. As these territories swelled to include many city-state subsidiaries, we also see the rise of a truly elite “ruling class,” specifically, priests, military leaders and royals. The larger a kingdom became, the more laborers there were to be bent into the service of state/elite projects (i.e., projects of conquest, of infrastructure, and of cultural monuments) and, as a result, the larger the agricultural harvests could become and subsequently taxed to support this emerging ruling class.

Let’s take a step back.

What, exactly, is a “kingdom,” or, in our more modern terms, a “nation”? Nature tends to produce structures which are emergent, fractal, continuums, not *absolute essences*—human creations like states and kingdoms, being natural, are no different. As with the other central concepts in this book, I encourage you to think of nations and kingdoms along a continuum (a point of view informed by Scott, 2017, p. 23). Kingdoms and nations are relatively integrated political territories revealing layers of bureaucratic administration oriented toward infrastructure building and maintenance, taxation, and defense. Another tell-tale sign of kingdoms is the relatively more formalized construction of larger numbers of monuments, tombs, temples, storage facilities, military equipment, and so on. Formally written records, codified laws, and standardized currencies are further indicators of a kingdom.

Kingdoms and nations are centralized aggregations of states; to the extent that states can be symbolically fused into a further superordinate national or ethnic identity, we have a kingdom/nation. Some kingdoms were comprised of a larger number of states than others, just as some states

have more embedded city centers or layers of bureaucratic administration than others.

As a general rule, horticultural villages have smaller populations than chiefdoms, which have smaller populations than states, which (by definition) have smaller populations than kingdoms. The expansion—often through brutal conquest—of ancient societies was an entrepreneurial project of rulers to embed distinct sub-societies under an increasingly large, centralized bureaucratic administration. And, while those individuals living in city centers or in the outlying countryside might be subject to the administrative law of states and kingdoms, they were not always willing participants. Indeed, perhaps the only thing people reliably had in common in such societies, if not vague superordinate identities, was a reliance on core infrastructure (such as irrigation and waste canals, roads, and waterways).

Kingdoms the world over tended to develop a similar social structure, because each was responding to intense, unprecedented, logistical problems related to defense and population growth. This structure tended to be composed of at least three levels of administration: a ruling class (typically a hereditary monarchy), a bureaucratic class (typically appointed nobles, although sometimes commoners were appointed to these positions), and laborers (often, slave labor, immigrant labor, or labor from peasants who did not own land) (Kelly, 2016). Outside of this three-layered structure of political administration, there were other social structures reliably found in ancient kingdoms, such as temples built according to a standardized template/design and other standardized structures for storing grain or for hosting council meetings (temples, tombs, monuments, and other sacred buildings tended to be concentrated in kingdom’s capital city). Temples, tombs, monuments, and so on were constructed, for the most part, using indentured laborers who were “paid” (i.e., fed) using standardized bowls for distributing grains.

Archaeologists typically regard the Kingdom of Sumer as the first truly massive, bureaucratically centralized, polity with a population topping one million people (Scott, 2017). Uruk and Babylon around 3,200 BCE were the most massive city-states composing Sumer, but, in fact, the kingdom was composed of numerous city-states and territories of varying sizes, stretching from Ur near the Persian Gulf to Kish and Nippur a bit inland to the north. Each city-state that comprised Sumer had a god specific to it, and these gods were memorialized with large temple estates “on which crops were grown, livestock was raised, and artisans labored” (Flannery and Marcus, 2012, p. 476). People in these Sumerian city-states lived in areas zoned by class or by occupation, and each city-state’s central bureaucracy collected taxes which were used for purposes of conquest and further infrastructural or cultural (i.e., temple or monument) development.

Like all kingdoms, Sumer eventually was, itself, conquered. The kingdom of Akkad (otherwise known as the Akkadian Empire) conquered Sumerian city-states around 2,350 BCE (McIntosh, 2017; Kornfeld, 2009). This kingdom was named for its capital city, Akkad, and was ruled by a man known as Sargon the Great. Sargon's kingdom, however, would lose its dominance over the region by 2250 BCE after being overrun by the Gutians, a people who lived in the mountains of modern-day Turkey. Ur-nammu, another warlord with ambitions for empire, would run the Gutians out of the region and organize the rebuilding of the Sumerian city-states conquered by Sargon of Akkad. Ur-nammu's period of rule, known as the Third Dynasty of Ur (named after the capital city of Ur) and also as the Neo-Sumerian empire, became the predominant kingdom of Southern Mesopotamia by 2100 BCE (Kornfeld, 2009). However, within about 100 years, the Elamites from modern-day Southern Iran would conquer and destroy Ur in order to establish their own Elamite kingdom.

Like this, kingdoms and city-states popped into and out of existence, each a unique experiment in governance and culture. As time went on, kingdoms slowly and inconsistently became more bureaucratically regulated and the administration of authority became more and more formal and regulated. By 1750 BCE, for example, Mesopotamia had a new ruler and a new kingdom—that of Hammurabi—and, by this time, market transactions were becoming more formally conducted using silver pieces as currency. By 1595 BCE, though, a new group of people, the Hittites, had invaded Babylonia, dethroned Hammurabi, and begun building new temples, monuments, and shrines of their own. About 1,000 years later, Cyrus the Great conquers Babylon once more, this time in the name of a Persian kingdom. Before long, around 334 BCE, Alexander the Great conquers this Persian kingdom and brings the land under the administrative authority of his own Macedonian kingdom. While many of the buildings of conquered societies were re-constructed from the ground up, infrastructural systems—for example, roads or irrigation systems—were often retained and renovated.

A roughly similar tale of conquest, new invasion/collapse and re-building under a new authority can be told wherever kingdoms emerged, from Mesopotamia to China to Mexico.

I will use a particularly vivid example to try and make this point. Eridu was one of the first large cities in Southern Mesopotamia. In fact, some of the earliest temples from the Ubaid period (~7,000 BCE–3,500 BCE) have been found at Eridu archaeological sites (Frangipane, 2016). However, when archaeologists first began unearthing the ancient structures of Eridu, they discovered that the city itself had been built, literally, on top of a litany of previously existing villages. Archaeologists dug some 40 feet into the surrounding soil and, in doing so, unearthed the remains of *at least* 19 villages and 17 temples from eras preceding that of Eridu

(Flannery and Marcus, 2012). Over a stretch of about 2,000 years, buildings were being erected, demolished and re-erected with different form and layout. It would be hasty to conclude that all of this razing and rebuilding resulted from conquest or from shifting political alliances, but it is plausible that much of it did.

Sumer, Akkad, and subsequent kingdoms happened to be enormous in size, but other, smaller kingdoms have existed as well. It is not the size of the population that makes a kingdom, but rather, it is the degree of successive bureaucratic embedding of territories into towns/villages into cities into states into a superordinate kingdom and, potentially, into networks of kingdoms or what Turner (2010a) calls “inter-societal systems.”

Consider the relatively smaller Zapotec kingdom, an agricultural society in ancient Mesoamerica that began to form around 700 BCE. At its height, Zapotec society was divided into two over-arching classes of people: hereditary rulers (and their noble assistants and associates) and commoners. The royal monarchy and a council of aristocrats, led by a king, administered orders and plans to major and minor nobles. Religious authorities were, also, appointed on the basis of their aristocratic birth. With regard to commoners, some Zapotec citizens owned land, but many were peasants without land. Laborers were rationed with tortillas, which were mass produced using griddles in the capital city of Monte Albán (the Mesoamerican equivalent to the barley wheat rationed in bevel rim bowls in ancient Mesopotamia).

In some cases, Zapotec elites would grant citizens particular bureaucratic appointments, so a certain small degree of upward mobility did exist. In fact, this sort of upward mobility presumably occurred in many agricultural kingdoms, from Sumer to Egypt to China to Rome. While the rate of this upward mobility was meager compared with our modern standards, the granting of prestigious bureaucratic positions to commoners, over time, perhaps encouraged elites to consider that “a skilled commoner makes a better official than a corrupt or incompetent noble,” (Flannery and Marcus, 2012, p. 420).

The structure of Zapotec society consisted of at least four administratively and economically embedded levels. The first level included the capital city of Monte Albán, with a population of around 15,000 people. This was the heart of trade and commerce, and where central planning for the rest of society occurred. The second level was composed of towns of up to about 2,000 people each (the largest of which might be considered cities by the standards of the time). Decorative palaces and tombs adorned these towns and, of course, many grand monuments dotted the city of Monte Albán. The third level was composed of at least 30 towns of up to 700 people each. Several of these towns were home to at least one sacred temple, but none had any palaces because those were reserved for the larger, and one might suspect more politically influential, cities. Finally,

the fourth level of Zapotec society was composed of around 400 small villages, and there is no archaeological evidence of any temples or palaces having been built in any of them; these small villages represented the political outskirts of the kingdom.

The total population of the Zapotec kingdom was at least 40,000 people, orders of magnitude larger than a typical nomadic foraging society or a single small horticultural village. Much larger kingdoms would emerge elsewhere—the population of ancient Egypt was at least a couple of million people, the population of ancient Greece was about a dozen million, and the Roman Empire might have governed nearly 100 million people. But, in each case, societal structure involved the successive embedding of territories, villages and cities into a hierarchy of bureaucratic administration.

Carneiro (1970; 1978) has chronicled how the number of independent societies declined in prevalence over the last 10,000 or so years due to being consolidated into growing kingdoms. According to his “circumscription theory” of state and kingdom formation, it was only a matter of time before growing agricultural communities would run up against limits to growth if neighboring territories were not conquered or co-opted. The city-states of ancient Southern Mesopotamia are an emblematic case of this—the Nile Valley is framed by deserts, mountains, and large bodies of water. Carneiro’s argument is that limited habitable and arable land, juxtaposed with growing populations, produced a competitive context of warfare and conquest.

Another account of the formation of kingdoms is that of Christopher Chase-Dunn (2001; Chase-Dunn and Hall, 1997). Chase-Dunn’s model incorporates Carneiro’s circumscription thesis and describes how the dynamics of circumscription tend to play out. Once growing tribes, village confederacies or nascent states begin to run up against limited habitable land and resources, conflict with neighboring groups over land becomes more likely. This conflict, over time, produced and instantiated wartime hierarchies—hierarchies of military prestige, of rulers and subjects. To the degree that there was a clear victor in these wars of conquest, land would be co-opted and the administration and expansion of the winning society would continue in the occupied territory. Continued population expansion ensues, with conquerors now taking advantage of the land and resources of the conquered territories.

Tilly (1975) was correct to say that “war made the state and the state made war”. However, do not mistake my focus here on kingdoms as a claim that only kingdoms waged war. Nothing could be further from the truth. Societies of all sizes have waged successful campaigns of war against the states of large kingdoms—consider the collapse of the Akkadian Empire, or of the possible role of the “sea peoples” in the decline of the Roman Empire (Cline, 2014). Rather, the point is just that kingdoms

waged war with more sophisticated technology and with much larger armies, and that this made them, over the long stretch of history, more successful on average in projects of conquest compared to bureaucratically unincorporated towns or villages.

Cohen (1984), for example, compares the war-making capacity of the unincorporated territory of Bura to that of the state of Borno. Although both societies are Nigerian, Bura is much smaller, and has fewer surplus resources than does Borno. Now, consider their militaries. The military of Bura was composed of adult men drawn from three villages, totaling about 50–200 people. Their weaponry included spears, shields, poisoned arrows and concealed pits. On the other hand, the military of Borno was composed of an army of over 10,000 men drawn from a population of millions, and their arsenal included armored cavalry, specialized bowmen and spearmen, and many hundreds of reserve warriors. Thus, the point is not that only large city-states and kingdoms waged war successfully but, rather, that the war they waged was over the long term *more likely* to be successful and that this was owed to their more populated militias composed of specialists wielding increasingly more complex tools of warfare.

The search for land and resources motivated the increasingly intensified use of existing land and resources, leading to the inter-related problems of soil degradation (resulting from salination or desertification), deforestation (resulting from excessive use of wood for building and crafting) and what Kennedy (1987) called “imperial overstretch” (resulting from too many expensive wars being fought on too many fronts). The combined result was often a decline in crop yields, a decline in available building materials (especially wood and timber for the earliest large-scale societies) and an exhaustion of military morale and funding. Large city-states and kingdoms eventually faced increasingly irreversible fissioning and collapse—after all, there were often other growing societies nearby with elites and warlords eager for expansion themselves. And, before the advent of writing and widespread literacy, a society’s myths were transferred only orally, making them particularly vulnerable to co-optation and re-construal by new conquering powers (Flannery and Marcus, 2012).

When using the term “collapse,” I intend to follow Tainter’s (1988) conceptualization—societal collapse rarely involved some immediate wholesale destruction. Rather, societal collapses take place over decades, if not centuries, and involve slow, incremental declines in economic and political complexity. Often, what happens is that rulers begin to hit limits to the taxes they can extract from their citizens, perhaps because soil has begun to salinize or erode from excess cultivation, or perhaps the costs of wars on multiple fronts are becoming too expensive. At this point, rulers face one of three options: (1) force peasants to pay even higher taxes and risk rebellion; (2) pursue technological innovation to increase productivity,

which might not pan out; or (3) pursue conquest of surrounding territories and their available resources (Spencer, 1998).

Each of these pursuits has risks—insurgent civil rebellions within a kingdom have led to the decline of many societies, funding for technological innovation might just be used to pursue profit instead of increased efficiency and the pursuit of conquest is itself often exorbitantly expensive. If the kingdom in question falters along (1)–(3), they become vulnerable. Just the same, however, (1)–(3) might prove to be successful, and the society might continue to sustain itself, even grow. However, if strategies (1)–(3) do not successfully sustain the kingdom’s bureaucracy, military and citizens, then difficult-to-reverse fissioning and collapse might be imminent, and will only be accelerated by any additional stressors like famines, floods, earthquakes, diseases, new wars, market downswings, or rebellions (Cline, 2014). Increased taxation, pursuit of technological innovation and conquest all, rather interestingly, might be said to mark the beginning *and* end of kingdoms and nations.

I have mentioned the role of brutal conquest in establishing kingdoms, but kingdoms were not only formed out of *between*-society conflict. They were also formed as a result of sometimes violent competition *within* societies, particularly competition among royal lineages for administrative authority. Rather consistently throughout history, disputes among elites in the economy or in the military or in royal hierarchies grew rancorous and distracting enough to make the kingdom vulnerable to conquest from outsiders. As societies grew in size, elites found themselves desperately responding to increasingly intensive “logistical loads” related to the production, regulation and distribution of energy and survival-relevant resources (Turner, 2010a). Moffett, for example, points out:

“When a society, human or ant, becomes sizeable, the demands on it to provide for and protect its members grow intricate and diverse. Consequently, so must the means by which these obligations are met. Methods must be found for the transport of supplies, troops and other personnel when and where goods and services are required.”

(Moffett, 2019, p. 293)

At the same time, the larger a society, the greater the food/grain surplus, meaning that larger numbers of elites can be sustained full-time (via coercive taxation of farmers). What happened across the kingdoms of history was that the task of governance became acutely complex at roughly the time when there was also the largest numbers of elites and elite aspirants, leading to often pointless infighting while the structure of society (often subtly, at first) began to fission and collapse, owing to poor resource management.

The lifespan of kingdoms appears to be between 200 and 500 years (or less) precisely because their size and complexity produce mounting logistical loads that require accurate intel, data and strategy to respond adequately (Tainter, 1988). Yet, contrary to the patience, reflection and data-driven decision making that would have been required to maintain their kingdoms, pharaohs and kings for the most part believed themselves to be beyond reproach, gods among mere mortals, incapable of making poor decisions. The failure of ancient kingdoms to fund their many wars, or feed their many mouths, was only taken seriously when the problems had become insurmountable. The kings of history (and today) were not the small-village “big men” of early horticultural societies, directly accountable to the collective for rational decision making and resource provisioning. These were rulers with almost total authority, total control, and the narcissism to justify it.

And, lest I give the impression that conquest was some clean business of the larger, more powerful or more well-organized army defeating the smaller or less organized army, it is important to emphasize how uneven the assimilation and integration of conquered societies were. Individuals in conquered societies might be ambivalent or, more often, hostile and rebellious towards the conquering society. Conqueror and conquered might speak different languages, eat different foods, and worship different gods. Often, the sense in which societies were conquered is the sense in which they were formally subject to the bureaucratic administration of a central ruler—a forced, coercive superordinate political fusion. This cannot be taken to mean, necessarily, that conquered territories were fused with conquerors in the sense of sharing some subjectively held superordinate identity. As Flannery and Marcus insist, “The reason military force so often seems to be involved in the creation of...kingdoms is because rival chiefs are unwilling to surrender their territory and independence voluntarily,” (Flannery and Marcus, 2012, p. 365). The same might be said for conquered peoples, not just their chiefs.

The kingdoms of history were also the source of the world’s first known currencies and written texts (Chase-Dunn and Lerro, 2014). Currency and written language, along with growing populations and increasing occupational specialization, helped produce the world’s first truly large-scale economic markets. By around 5,200 years ago, during the late Uruk period in Mesopotamia, for example, inscriptions suggest the existence of a variety of occupational specialties like foreman, smith, metal caster, mason, carpenter, and accountant (Flannery and Marcus, 2012). Many sociologists and economists insist that market economies are unique to the 16th century and after, but this just is not true—markets are as old as trade relationships and as soon as societies expanded in population as a result of intensifying plant and animal cultivation, so too did markets expand (McCloskey, 2016). Of course, it is true that avenues for working class and

middle-class entrepreneurialism emerged in widespread fashion only later in history. Yet, the point that I hope to make here is that a growing population and swelling, embedded, social strata motivated the development of formal currency, literacy/record-keeping and expanding markets for goods.

Some later city-states such as the Republic of Venice and Athens had a substantial (not by our standards, but by the standards of ancient kingdoms) cadre of middle-class entrepreneurs who began formally influencing the political structure (Fleck and Hanssen, 2006). These city-states were so enormously wealthy, on account of natural resource abundance, accumulations in technological innovation, and their geographic location near trade hubs, that threat perception to some extent abated and divisions between social strata were relaxed. This allowed more commoners—so long as they were wealthy merchants—to enjoy greater political power. Local participatory democracy in Athens and in other cities in ancient Greece were the paradigmatic examples of this (Raaflaub et al., 2007). The relaxing of divisions between elite and commoner and the emergence of participatory democracy (albeit only for male citizens) in ancient kingdoms/early states, however, certainly seems to be the exception and not the rule.

Athens and Venice were (and are) proximate to central waterways, the Adriatic, Aegean, and Black Seas in particular, used for trade at a time when many valuable goods from faraway lands traveled by boat. This proximity to central veins of the ancient economy made it comparatively easy for a skilled farmer, labourer, or merchant to accrue wealth by selling goods or offering services and, consequently, to transfer this wealth into demands for political power. Also, new innovations in plant cultivation like grafting and budding techniques—which, among other things, made the domestication of olive trees and the production of olive oil more efficient—opened new markets and generated even more wealth (Fleck and Hanssen, 2006).

Again, however, Athens and Venice seem to be the exception and not the rule in ancient city-states. Also, critically, slavery persisted in places like Athens, women had comparatively less political power, and wealth inequality was extreme (GINI estimates of inequality in ancient Athens hover around 0.40–0.45, see Morris, 2015). Thus, while places like classical Athens were an exception to the typical lack of democracy in early states, it was no such exception when it came to wealth inequality, gender inequality, and slavery.

Still, it is instructive for us to note that those ancient city-states capable of generating the most opportunities for obtaining wealth among laborers and the middle-class were also the most ethical even if only by accident and even if much of their society remained profoundly unethical. Not a single woman held citizenship in ancient Greece, and no slave was considered free until voted on by state politicians, yet, access to participatory

democracy was available for any free male citizen for the first time in human history since the emergence of large horticultural and agrarian city-states and kingdoms (I regard forager societies as, typically, more or less democratic). The lesson here is not that ancient city-states were necessarily morally progressive, but rather, that (1) they rarely were; (2) their moral progress was frustratingly partial; and that (3) moral progress of any kind was best discernible only when such city-states were capable of mitigating high levels of threat as well as generating substantial wealth (Morris, 2015).

Finally, we should discuss an important coordination problem facing people living in very large city-states and kingdoms: they must interact with, and at some level trust, people they do not know, have never met before and might never meet again. At the same time, elites must concern themselves, at least to some degree, with the well-being of the peasantry, lest rebellions break out. Recall that humans evolved in small bands of foragers, with bands loosely aggregated into superordinate tribal or ethnic groups. However, as we have discussed, sometime after the stabilization of the global climate at the dawn of the Holocene, amidst an increasingly sedentary and agriculturally focused pattern of subsistence, human societies began scaling dramatically in size (Diamond, 2012). This scaling of human populations beginning along the Tigris and Euphrates rivers stood in marked distinction to the small, close-knit bands of nomadic foragers that had characterized the human species for the vast majority of our existence.

In order for this scaling in population to have occurred the rampant problem of “free-riding” would have had to be addressed. A sedentary, agricultural mode of subsistence created a significant increase in available calories relative to the nomadic energy-intensive foraging mode of subsistence. Given this increase in available food, so much so that humans began storing food to an unprecedented degree, why did human farmers continue to work so hard? Why did these early societies in the Middle East and elsewhere ostensibly remain so cohesive amid such surplus, as opposed to dividing into distinct societies, warring sub-cultures, or collapsing altogether?

Some scholars cite game-theoretical simulations to show that neither kin-based nepotism nor tit-for-tat reciprocal altruism would be sufficient for maintaining cooperative norms with strangers and distant acquaintances, as would be required for a foraging tribe to scale to the size of early cities of thousands or to millions of people in kingdoms (Boyd and Richerson, 1988; Panchanathan and Boyd, 2003; Chudek et al., 2013). Put simply, as populations scale up, the number of kin-based interaction partners (as a proportion of total interactions) declines geometrically, and information about the reputations of distant or unfamiliar others becomes unreliable or distorted by gossip and self-interest.

This is not to say that connections with kin or familiar others become suddenly irrelevant when societies scale in size, only that the relative proportion of interactions with unfamiliar or dissimilar people increases. A variety of scholars have attempted to explain how political territories could be maintained when people begin interacting more and more with individuals anonymous to them. After all, large economic markets require some degree of trust among individuals who do not know one another personally, so too does the large-scale extraction of taxes or the coordination of labor. While we definitely should not presume that the kingdoms of antiquity (or, for that matter, contemporary societies) were smoothly operating cohesive units, there does appear to be something worth explaining, given that political territories appeared to operate with some degree of coordination despite the amount of interaction between individuals who would have been anonymous to one another. Put differently, the question is: how did people in massive city-states and kingdoms manage to extend their notion of fictive kin to an unprecedented number of people?

On the one hand, the anonymity of a large society no doubt enabled kings to disregard the welfare of their subjects to some extent—slave labor, for example, was commonplace in the kingdoms of history, and was used extensively to build infrastructure or cultural monuments and to fight wars. Had kings known their subjects personally—as leaders of foraging bands and small horticultural villages would have—the casual use and disposal of human life would have been more ethically difficult. The anonymity of large-scale societies thus facilitated the brutalization of a kingdom’s subjects.

On the other hand, however, people were beginning to conceive of abstract groups of people in a way that was historically novel—in the large kingdoms of history, we begin to see people categorize and define one another by their social class and occupation. Making these points, Kelly (2016) writes:

“In agricultural and foraging societies, even the large, socially complex ones that anthropologists call chiefdoms, kinship is the dominant principle that links people...Kinship still matters enormously in state societies [and kingdoms]...However, in state societies [and kingdoms], kinship matters more *within* than *between* classes. In early state societies [and kingdoms], a new set of relationships was added, ones that entailed codified relations with the ruling body, such as government officials, tax collectors, and military commanders. Relations with these people are governed by cultural and legal rules. You don’t have to know police or tax collectors personally in order to know how to behave in their presence. The same happens when we have classes...[However], it’s much easier to enslave people and get them to

build pyramids or to send them onto the battlefield as cannon fodder if they are not your relatives and, in fact, if you don't consider them to be as human as you are.”

(Kelly, 2016, pp. 86–87)

I quote Kelly at length to underscore two mechanisms by which humans in large, increasingly anonymous societies maintained some degree of coordination: coercive force (i.e., elites forcefully directing the labor of slaves and non-land-owning peasants) and new forms of cognitive abstraction (i.e., grouping others according to their official positions, titles, occupations or classes and relying on stereotypes and intuitions to guide interactions).

Other theorists (e.g., Norenzayan, 2013; Norenzayan et al., 2016) point to the presumably widespread adoption of new cultural identities, for example, as believers in particular gods and mythologies, which might have served as new superordinate identities. “Axial Age” monotheism, for example, might have been an ideology conducive to both the spread of a common identity (i.e., god-believer, or god-fearer) and the maintenance of social order, owing to fears of supernatural punishment or retribution. Monotheistic gods were considered by adherents to be all-powerful (i.e., no limits to their territorial, ethnic, or cultural jurisdiction), they were believed to be morally interested in human conduct, and they were believed to maintain a constant, watchful supervision with the intention of providing rewards or punishments insofar as individual people met or failed to meet the god's demands for pro-sociality towards other adherents.

These theorists also argue that a felt sense of supernatural monitoring as well as fears of supernatural punishment were the two most fundamental mechanisms linking the emergence of monotheistic ideation to increasing within-group pro-sociality. Belief in the omnipresence and omniscience of a powerful supernatural agent, they claim, draws people's attention toward their reputations—as well as toward the possibility of imminent punishment—and thus increases the probability that a given person will act pro-socially (Bering and Johnson, 2005; Johnson, 2011; 2015).

So, because rulers and their roving militias could not realistically keep watch over the behaviors of everyone in their kingdoms, perhaps, an overarching unfalsifiable belief in an all-powerful supernatural being helped reduce the prevalence of vigilante violence, theft and murder within a political territory, while also, at least to some extent, motivating pro-social trust toward others in one's society that might be personally unknown, but who might be assumed to share one's own belief in a particular god. I think this account is fine as far as it goes, but we should not think that peoples' sense of being watched by a god simply pops out of thin air or

could be easily imposed by kings. People's sense of moral obligation to a supernatural authority would need to be reinforced in very non-supernatural social groupings.

The sense of being watched by a god might have been more of a byproduct of being socially integrated into a very large society that was, quite non-supernaturally, and quite earnestly, keeping tabs on people (if not always through the policing of their behavior, then through the taxation of their livelihoods). I tend to side more with Guy Swanson (1960) and Emile Durkheim on this—it was the rise of large states and kingdoms that gave people the sense of being watched by a punishing superpower. I suspect that people's notion of a monotheistic god was their—perhaps subliminal—attempt to symbolically construe the increasing watchfulness and control being exerted over them by politicians, priests and militias. Elites would have been fine with commoners imagining their kingdom to be a kingdom of a god on earth, as this would only serve to legitimate and instantiate their authority.

We should not assume that people's fear of supernatural punishment necessarily enhanced their willingness to cooperate with others. After all, a person might just as well become avoidant of social interactions with strangers in order to avoid any indiscretion that might lead to supernatural punishment. We also should not assume, insofar as belief in big monotheistic gods *did* enhance cooperation, that this was motivated by desires to avoid punishment. Shared beliefs in the same god among people within a polity might have driven cooperation and trust quite independently of any fear of punishment. After all, people seem to prefer associating with those they perceive to be ideologically similar to themselves, especially when they feel uncertain (see Grant and Hogg, 2012; Deghani et al., 2016; Huber and Malhotra, 2017). Additionally, to the extent that any religious cosmology in early kingdoms was tied to particular ethnic distinctions, the interaction of ethnic identity and religious identity might have been especially motivating for those sharing both identities to see anonymous others in their societies (who appeared to share the same ethnic or religious identity) as trustworthy, fictive kin.

Moffett (2013; 2019) suggests, quite correctly, I think, that the human capacity for symbolic abstraction could be leveraged by political elites to create superordinate identities at the city-state and kingdom levels. This need not have been some self-aware act of genius oriented intentionally toward keeping large societies intact, rather, in most cases, it was likely a side-effect of rulers attempting to reconstrue mythology and religion to support their rise to power. The many sacred monuments, temples, palaces, and tombs along with particular standardized styles of construction or pottery or writing would have been capable of giving citizens the impression that they all belong to some cohesive cultural territory. The royal pursuit of control and influence thus had the consequence of providing a

shared general cultural identity with which commoners—who knew one another only little if at all—could collectively identify.

Moffett’s take, I would say, is a twist on Durkheim’s and Mauss’s ([1903] 2009) structural theory of cognition: the cultural homogeneity of the built environment would have conferred a sense of shared fate, or similarity, among people who might otherwise have no reason to assume any similarities in one another. Let’s push this a bit further, then: the homogeneity of the built environment would not only have involved temples, monuments, grain storehouses, pottery, and other cultural items, but also, critically, shared infrastructure (roads, waterways, irrigation systems, and so on) which would have given people the impression of sharing a common fate with others in their political territories, even those they did not know well or had not yet met. Every kingdom known to archaeology has some form of centrally planned canals, roads and irrigation systems. With these (and other) forms of central infrastructure, people might become increasingly cognizant of a, quite literally, shared fate.

Regardless of the import of supernatural beliefs for driving social cohesion in city-states and kingdoms, we can feel confident that an increasingly formalized/homogenous built environment, superordinate class and occupational distinctions (along with, of course, superordinate identities related to the city-states and kingdoms themselves) all could have provided people with a sense of general belonging even among those they did not know well. These new, emergent, superordinate identities would be capable, at least to some extent, of (1) reducing the perception of competition between individuals and groups within a society; and (2) increasing coordination between individuals and groups within a society, which, taken together, might increase a society’s capacity for (3) mobilizing labor and funds for infrastructural projects; (4) successfully waging war; (5) expanding geographically; (6) (perhaps minimally) integrating immigrants; (7) successfully coordinating large-scale responses to natural disasters or disease; and (8) successfully growing economic markets for particular commodities (wines, exotic oils, precious stones, metals). And a society that can successfully wage war, expand, respond to disaster, and grow its markets can, in turn, accommodate larger populations, in a feedback cycle of growth and expansion.

“For the first time since creation [humans] will be faced with [their] real, [their] permanent problem—how to use [their] freedom from pressing economic cares, how to occupy the leisure, which science and compound interest will have won for [them], to live wisely and agreeably and well.”

(Keynes, 1930 [2010])

2.1.3 Rising Per Capita GDP and Worldview Change

“The future is already here. It’s just not evenly distributed yet.”

(attributed to William Gibson)

The philosopher Karl Jaspers ([1953] 2014) has famously argued that ideas about law, ethics and self-actualization began to shift profoundly between 800–200 BCE. Jaspers coined the term “Axial Age” to describe this period when public (especially elite) attitudes supposedly began shifting. If I can charitably paraphrase, Jaspers regarded this time period as revealing a unique emphasis on *personal transcendence* (i.e., human life has purposes beyond material wealth or survival), *self-discipline* (i.e., people should not be indulgent in their pursuit of sex, food, status or power, and should practice abstinence, material detachment and fasting), *empathy* (i.e., people should help or empathize with the poor, the sick, and the down-trodden) and, perhaps above all, *universalizing explanations* (i.e., explanations for nature and reality which were assumed to apply in all times and all places).

Jasper’s language is often fuzzy and goofy—he speaks of the “spiritual foundation of mankind” rising during this Axial Age (when what actually rose was energy capture, in other words, increasingly efficient extraction of resources, resulting from changes in subsistence), of prehistory being a “dark world” (when, in fact, nomadic foragers are quite creative in their art and mythology) and of monotheism being especially important (when, in fact, the rise of monotheistic gods was likely an epiphenomenon of increasing societal complexity, see Whitehouse et al., 2019)—but Jasper’s basic framing of history generated much debate and discussion nonetheless.

However, only recently have some scholars begun thinking about the possible material foundations of this apparent change in worldview. For example, Morris (2004) cites some astounding increases in the standard of living for ancient Greeks where “axial”-esque philosophies, like stoicism, began to emerge. From 800 BCE to 300 BCE, the size of houses grew between five and tenfold and the consumption of clothing nearly tripled. Fuel use (i.e., plant oils, wood) grew 25% and food consumption grew about 13%. And, most telling, the estimated population of Greece during this period grew tenfold, with aggregate consumption of resources during this period growing 15- to 20-fold (see Morris, 2004, p. 727). Morris writes:

“What drove the impressive improvement in Greek standards of living between 800 and 300? There was no technological revolution, although we can see a number of small improvements accumulating across these five centuries...The crops cultivated in Greece did not change much across the first millennium BC, although there is growing evidence that climatic changes starting in the ninth and

eighth centuries made the Mediterranean environment more favorable... The basic techniques of plow agriculture did not change much. Iron tools were used across the whole period 800–300, although early on they might have been rare and expensive. The earliest cache of iron tools known dates around 700, but by the fourth century they are common on sites like Olynthus.”

(Morris, 2004, pp. 729–730)

As far as Morris is concerned, the increase in standard of living during Axial Age Greece was more attributable to increasing literacy (literacy rates rose to ~10% of the population from a prior historical baseline of about 1%–5%), and egalitarian political policies, than it was attributable to any innovations in infrastructure. Yet, he also points out that the phenomenon of rising population and consumption of resources occurs in Crete “between 2000 and 1500 BC, and...[in] Greek regions of the east Mediterranean between AD 300 and 550,” (Morris, 2004, p. 734). This would seem to suggest a need to widen our conceptualization of the time frame for the Axial Age, and might also suggest a need to look beyond particular cultural or ideological changes in favor of a greater focus on slow, steady, innovations in infrastructure. In fact, in his more recent work, Morris (2015) seems to make such a case. For example, he carefully documents incremental increases in energy capture beginning around 14,000 BCE and continuing to the present day (with a huge exponential leap in energy capture after ~1700 CE).

Thus, we cannot tenably limit the Axial Age outlook to some *sudden* emergence between 800–200 BCE. Several of the “world religions” still prevalent today, from Buddhism to Christianity, are often assumed to have arisen during Jasper’s Axial Age period. However, a review of the particular dates when these religions were founded suggests a much wider time frame than 800–200 BCE. For example, in East Asia and India, we find that while Buddhism dates to ~300 BCE–180 BCE, Daoism dates to ~500 BCE and Confucianism dates to ~600 BCE, Hinduism can be dated to ~1500 BCE, while in the Middle East and Mediterranean areas Zoroastrianism dates to ~1500 BCE. Or, consider that while Second Temple Judaism dates to ~500 BCE and Stoicism dates to ~300 BCE, Christianity is much more recent (~1 CE) and Islam even more so (~600 CE).

This substantial range in dating the so-called Axial Age is further complicated by the archaeological discovery of the Code of Hammurabi, an ancient Babylonian stone tablet prescribing various laws designed to control and regulate the behavior of civilians *and* elites alike, that dates to ~1754 BCE. Prior to the Code of Hammurabi (and other chronologically concurrent legal codes such as the Code of Lipit-Ishtar), there is little evidence that military, religious, political, or high-level bureaucratic elites were subject to any civil or criminal laws whatsoever. Yet, in the Code of

Hammurabi, we see an injunction that any perpetrator of a crime should be subjected to a level of punishment commensurate to the harm caused (Sterba, 1976).

For example, according to the Code of Hammurabi, if an architect or builder commissioned a house or temple that subsequently collapsed in on people and killed them, the architect or builders should be killed to balance the scales of justice. If the house simply collapsed without killing anyone, then the architect was responsible for repairing the damage. Effort was also made in these Mesopotamian legal codes to establish that people cannot contractually obligate one another without the consent of the obligated party. This means, for example, that if Person A owes a debt to Person B and claims that Person C will pay back person A's debt, Person C is under no obligation to do so, and Person A will be held liable for any repercussions which befall Person C for being placed in this unenviable position.

Early legal codes like these might have been "strict, mechanical and austere," (Sterba, 1976, p. 25), as well as devoid of any emphasis on reformation or forgiveness, but what is unique about them is that they appear to have been applicable (in principle, if not in practice) to any person. It is as if justice and fairness were coming to be considered as universal concerns and worthy pursuits regardless of the status or office of the individual.

Even if we grant that the existence of laws is not the same as their actual on-the-ground enforcement, we should still be intrigued by these legal codes, as they were quite popular: certain statutes from these codes have been found inscribed on clay tablets in archaeological dig sites dating to at least one thousand years after King Hammurabi's regime in Babylon. The wide range of founding dates for world religions, the dating of legal codes emphasizing universal rules of justice (e.g., Code of Hammurabi, Code of Lipit-Ishtar) and other sources of evidence have led more recent scholars to conclude that there might not have been a single Axial Age occurring between a delimited range of dates (Mullins et al., 2018; Hoyer and Reddish, 2019).

Jasper's focus on 800 BCE–200 BCE as being some magical period in human history was overdone. Instead, the current best evidence suggests that societies were becoming more socially complex and producing more goods and wealth slowly, in fits and starts, since the origins of sedentary villages and systematic plant cultivation 10,000–12,000 years ago, and that the combination of these factors were motivating people to change how they viewed their lives, the lives of others, and what sorts of policies were ethical and imperative. Social complexity took many forms, for example, increasingly intensified plant and animal cultivation in kingdoms, accumulating technological and strategic innovations in farming, a slowly increasing economic division of labor, and slowly spreading

economic markets involving people from increasingly distant lands. There was no single Axial Age period, rather, human societies were (and are) becoming better able to capture and store energy from their environments, leading peoples’ (initially, elites’) lives to become progressively longer, safer, and more comfortable.

Consider how Antipater of Thessalonica, writing poetry about the goddess of agriculture (“Ceres”) in first-century BCE Greece, describes the joys of the increased productivity of water mills over human-powered grain mills:

“Set not your hands to the mill, O women that turn the millstone! Sleep sound though the cock’s crow announces the dawn, for Ceres has charged the nymphs with the labors which employed your arms. These, dashing from the summit of a wheel, makes its axle revolve, which by the help of moving radii, sets in action the weight of four hollow mills. We taste anew the life of the first men, since we have learnt to enjoy, without fatigue, the produce of Ceres.”

(as quoted in Smil, 2017, p. 146)

These sorts of increases in production and efficiency were, in a quite literal sense, interpreted as religiously divine innovations (despite their quite human origins). Over millennia, and often non-linearly, energy capture from the environment was growing, and although people did not always appreciate it consciously as Antipater did, they nevertheless benefitted from longer, healthier lives.

Slow, nonlinear, improvements in economic complexity and quality of life motivated a shifting psychological outlook on life. In their review of the evidence, Harvey Whitehouse and his colleagues conclude the following:

“So, was there an Axial Age? We suggest the answer is “sort of,” but it was not so much an age as a stage in the evolution of social complexity—its distribution globally was wider and its origins historically deeper than anybody previously imagined,”

(Whitehouse et al., 2019, p. 403)

If the so-called Axial Age was not merely a particular period in time, but, rather, a long, slow, nonlinear increase in energy capture, how can we understand the shift in worldview and social psychology suggested by Jasper and others?

To do so, we can re-purpose “Life History Theory” in evolutionary biology.

Life history theory is a widely used framework in evolutionary biology (MacArthur and Wilson, 1967; Wilbur et al., 1974; Stearns, 1976;

Stearns, 1992). Until recently, this theory was used only as a means for understanding when species would adopt different patterns of reproduction and how these patterns might relate to rates of offspring survival. The theory specifies that when survival is uncertain (e.g., when resources are scarce or low in nutritive value, or when rates of predation are high), animals will evolve to produce larger numbers of offspring, each of which receive lower levels of investment from parents (known as “r-selected” species, because they maximize their *rate of reproduction*), whereas when survival is more certain, animals will evolve to produce fewer numbers of offspring, each of which is invested in by parents to relatively greater degree (known as “k-selected” species, because they reproduce only up to the *carrying capacity* of resources in the environment—the “k” corresponds to the original German term used to describe the environmental resource limit, or *Kapazitätsgrenzen*).

In orthodox evolutionary biology, then, the life history strategy of a given species emerges from a combination of: (1) the probability of survival for offspring as well as for adults capable of reproduction; (2) how long adults in the species can remain fertile; (3) how many offspring typically result from reproduction; (4) the amount of parental investment (in terms of care and resources) required for juveniles to reach a state of reproductive maturity; and (5) the degree of energy/resources required for the act of mate-finding and reproduction itself. Each of these influences the probability of survival and reproduction, with natural selection acting on propensities that increase rates of reproduction (from an evolutionary biological perspective, an animal’s survival is only fitness-relevant insofar as it enables reproduction).

If, for example, the probability of survival begins to drop for a species, biologists would expect that species to begin physiologically and psychologically adapting (inter-generationally) in ways that maximize the number of offspring produced and minimize the amount of time and resources parents invest in their offspring. By contrast, if the probability of survival increases (e.g., predation rates fall, or resources become more abundant), biologists would expect that species to begin minimizing the number of offspring produced and maximizing the time and resources allocated to each offspring, up to the resource limit afforded by the surrounding environment.

R-selected species produce larger numbers of physically smaller offspring which gestate for shorter periods and reach sexual maturity faster. R-selected species thus reproduce sooner and more frequently, but often have lower life spans on account of reduced parental investment, and as a byproduct of the harsher or more resource-restricted environments that they tend to inhabit. Competition for restricted resources with other conspecifics might also reduce the lifespan of r-selected species. Alternatively, relatively more k-selected species gestate for longer periods, mature to reproductive age more slowly and, as a result of greater parental investment as well as living in more

resource-rich (or low predation) ecologies, they tend to have longer life spans. Some examples of r-selected species (i.e., species with a relatively fast rate of sexual maturation and who produce relatively large numbers of offspring) include mice, rabbits, spiders, mosquitos, or weed plants and grasses. Examples of k-selected species (i.e., species with a relatively slow rate of sexual maturation, who produce relatively small numbers of offspring) include elephants, whales, humans, sequoia trees, and redwood trees.

Now, the point I would like to make here is that *r-selection and k-selection are theoretical ideal types; they are idealized abstractions representing a relative continuum of behaviors, not only a dichotomy of species types*. For example, compared to termites, dogs are k-selected, yet, compared with humans, dogs are r-selected. Moreover, if we, for example, consider a termite colony to be a biological unit in itself, we might conceptualize termites as revealing k-selected aspects, because they produce only one colony, which matures slowly, and requires a great deal of investment in time and resources (see Mahapatro, 2014).

Life History Theory is, ultimately, a framework to help researchers orient themselves to the ways that threat and resource availability might lead to flexible adaptations for certain traits or propensities over others. Yet, species are not somehow r-selected or k-selected by definition—an insect that reproduces 50 offspring per nest might be considered k-selected relative to an insect that reproduces 150 offspring per nest. Any application of the theory must be relative to whatever other animals are used for comparison.

Another important implication follows from this general approach to Life History Theory—the theory is applicable not only to evolutionary biology, but also to social psychology. That is, *within species*, those who live in relatively more stable, or resource-rich, environments might develop different social-psychological tendencies compared to those living in less stable, resource-restricted, environments. Life history theory is not just a useful framework for understanding how species evolve over time in response to natural selection arising from *objective* resource distribution or threat in an environment, it is also a useful framework for understanding how animals within species adapt their psychologies and social lives to the *perception* of resource availability and threat.

We can see subtle life-history switches evolving slowly among very genetically distinct living things (from weeds to insects to elephants), but we can also see it operating on a shorter time scale when looking within a species, or at genetically similar species. For example, chimpanzees and bonobos are very similar genetically, but their life-histories vary fluidly in response to their environments. This is likely why data are so mixed on these groups of primates; some studies show chimps to have a slower life history, others show bonobos to have a slower life history, and some studies show little difference (Behringer et al., 2014; Robson et al., 2006). Why is this?

It is because when we look at how life history adaptations work amongst very similar species, or within a species, we see a new process that was obscured when looking only at between-species or between-genus comparisons. Yes, life history adaptations can occur slowly over geological time scales, carving out species-specific strategies. But, if we focus our attention on just one species of animal, we can see far more fluid, relatively rapid, shifts occurring within a single individual's life! These relatively fast shifts of life history orientation might seem to be happening slowly to us as we go through life or as we watch generational change in our own families. But they are occurring on a time scale that is simply too rapid to result in permanent biological adaptations. So, there are modes of animal reproduction and development which result from biological adaptations to environmental conditions over long periods *and* there are modes of thought, perspective, and feeling which result from social psychological adaptations to environmental conditions over one's life course.

In sum, because animals of the *same species* (or very genetically similar species) nevertheless occupy distinct resource and threat niches, there is a cognitive calibration process whereby time-orientation, impulsivity, and degree of adherence to group norms and habits are adjusted relative to the perceived need for group protection and likelihood of survival and/or flourishing. My contention is that this can occur within a single individual's lifetime, not *only* among animals of different species over a long evolutionary time frame.

This is not orthodox evolutionary biological life history theory. What I am suggesting is a more theoretical life history theory—a version of the theory sufficiently abstract and broad to identify other conditions under which similar life history shifts occur (Del Guidice et al., 2016). All humans have relatively slow life history strategies compared to other animal or plant species, but some humans, some of the time, will perceive greater threat and instability in their environment, and these humans will calibrate their aspirations and motivations to this instability and threat so as to best navigate it.

Recently, some researchers have explored this application of life history theory in ways that are relevant for understanding some of the proximate, perceptual mechanisms operating during cultural evolution (Baumard, 2019). These researchers ask the question: how might substantial increases in existential security (e.g., longer life expectancy, reduced infant mortality, rising per capita incomes) have shifted people's worldviews in order to be more future-oriented, more invested in their individuality and more risk-averse? The safer and more stable one's environment, the more the resources in that environment can be dependably accessed for personal needs or desires. Group ties are needed relatively less (resources do not need to be so constantly shared to survive and flourish), and impulsivity, pleasure-seeking and a general short-term reward orientation begin to seem like obstacles for obtaining longer-term, more incrementally achieved, personal, or creative goals.

For Baumard (2019), in short, per capita increases in income are capable of shifting people’s worldviews and expectations. Moreover, this would occur at a sufficiently fast pace (over one lifetime or a few generations) that would preclude any functional changes to the evolved biology of the individuals. It is a perceptual, not an evolved-functional, adaptation to surrounding circumstances.

For example, humans in relatively more resource-rich environments with fewer threats to life and more opportunities for flourishing will tend to calibrate their goals and behavior to be relatively more future-oriented and more risk-averse. We might also expect people in such an environment to develop relatively more slowly, have fewer sexual partners, become sexually active later in life and have fewer numbers of kids later in life (Del Giudice et al., 2016).

And, occurring on top of this individual perception-environment calibration, we need to remember the role of larger-scale, widespread shifts happening beyond the individual and their immediate neighborhood or community membership. This might include, for example, rates of technological innovation or opportunities for entrepreneurialism in the surrounding society, along with how these opportunities might contribute to rising standards of living, and how this change in comfort might motivate slightly shifting perceptions regarding the value of riskiness or of what goals are most important, or of how much the surrounding community should be adhered to relative to one’s own personal expression and flourishing. The more long-term peoples’ goals become and the more people express themselves uniquely and creatively to one another, the faster the rate of technological innovation, which itself speeds up increases in material security.

Ronald Inglehart (1971; 1990; 2018) and his colleagues have pioneered some of the most important work in this area of shifting worldviews/values as a result of people’s rising material security over time. Specifically, Inglehart shows that in wealthy Western democracies, people place less importance on basic needs or issues of security and more importance on opportunities for personal growth and individual expression. Welzel (2013) suggests the applicability of Maslow’s (1954) old “hierarchy of human needs” to understanding these data—when people are concerned for their life due to natural disaster, famine, drought, poverty, or violence, they will tend to express “survival values,” and to the degree these dangers recede and life expectancy and occupational/educational opportunity grows, people will tend to express “self-expression values” (Inglehart, 2018). Beugelsdijk and Welzel (2018) put the matter like this:

“...when both security and freedom are in short supply, people prioritize security because security is a necessity to survive. But as soon as people feel safe, they begin to prioritize freedom because

freedom is essential to thrive, in allowing ingenuity, creativity and recreational pleasure. Hence, socioeconomic transformations that turn the nature of life from a source of threats into a source of opportunities nurture a generational shift in priorities from “survival” to “[self-expression].”

(Beugelsdijk and Welzel, 2018, p. 1470)

Survival values take precedence when there are abundant “pressing threats”; self-expression values take precedence when there are abundant “promising opportunities” (Beugelsdijk and Welzel, 2018, p. 1472). So, what are these “survival values” as opposed to “self-expression values”? According to Inglehart (2018, p. 38), the following are examples of the sorts of statements people concerned about their survival tend to agree with:

- “I am not highly satisfied with my life”
- “I am not very happy”
- “I do not rate my health as very good”
- “A woman has to have children to be fulfilled”
- “Men make better political leaders than women”
- “I wouldn’t want foreigners, homosexuals or people with AIDS as neighbors”
- “A good income and safe job are more important than a feeling of accomplishment and working with people you like”
- “Hard work is one of the most important things to teach a child”
- “Imagination is not one of the most important things to teach a child”

Inglehart’s work shows that people concerned for their immediate survival tend to endorse these statements, while those unconcerned with their immediate survival tend to disagree with these statements. Let’s consider what these statements indicate.

The first three statements above relate to subjective wellbeing, and the next two represent traditional gender roles (more aggressive and assertive males are preferred as leaders during times of danger and uncertainty; women tend to be relegated to childcare the more children they have). Statements on the importance of women as mothers also capture changing attitudes which have occurred during the “second demographic transition.” During the first demographic transition, sanitation and medical infrastructure improved, leading to more children surviving the childbirth process. During the second demographic transition, women began taking advantage of increasing opportunities for upward mobility in medicine, law, business, politics and entertainment and this (along with advances in contraceptive technology) has resulted in couples having fewer children. Data clearly show that, as economic and educational opportunities for

women have grown across the world, the number of children born to each woman has dropped. In the early 1950s, the average number of live births per woman worldwide was five, but this had halved by the early 2010s, when it dropped to below 2.5 births per woman.

The statement above on “foreigners, homosexuals, or people with AIDS” has to do with how closed peoples’ circle of trust is to outsiders and minorities—the greater the threats to material security, the more closed people’s sphere of moral concern. The final three statements have to do with the importance of obedience and security for those with survival values. This expectation of obedience and safety will tend to produce more closed group boundaries and greater hierarchical rigidity, yes, but for a person fearful of their survival, tight groups and strong hierarchies can feel protective.

It should not surprise us that societies with greater proportions of people expressing these “survival” values tend also to have lower levels of material security, along with a greater number of norms enforcing “uniformity, discipline, hierarchy and authority,” (Beugelsdijk and Welzel, 2018, p. 1472). Conversely, societies with higher proportions of people emphasizing “self-expression,” values tend to have higher levels of material security along with fewer, more casual, norms (Gelfand, 2019). When norms *are* strict in a materially secure society, they tend to mandate tolerance, openness, “diversity, creativity, liberty and autonomy,” (Beugelsdijk and Welzel, 2018, p. 1472).

There is, also, an important causal ordering here—rising levels of material security in prior generations is correlated with changes in “self-expression values” in later generations (Inglehart, 2018). Thus, it does indeed seem as though rising material security causes changes in peoples’ worldviews and value systems.

We must also keep in mind that there is important variation *within* countries, not only between countries. Within countries, certain geographic areas contain people who place relatively greater emphasis on survival (or self-expressive) values; this sort of variation can also be seen within economic class groups within countries, with poorer people expressing more survival values and better-off people placing greater emphasis on self-expression values (Harrington, 2017).

A recent study of nearly 500,000 people living in 110 countries between 1981 and 2014 found support for three dimensions that further differentiate people living in areas characterized by “survival” vs. “self-expression” values (Beugelsdijk and Welzel, 2018). The authors of the study found that people differed in the degree to which they (1) perceived themselves as embedded in or beholden to groups (people in richer countries had a greater expectation that group affiliations would be freely chosen, not imposed); (2) the degree to which they felt duty-bound to roles as opposed to seeking personal joy (with people in richer countries

expecting a balance of duty and personal growth/enjoyment); and (3) the degree to which people trust others (people in richer countries are more comfortable with uncertainty and in being in unstructured situations, but have lower levels of trust in politicians or police officers).

In their analysis, Beugelsdijk and Welzel (2018) found that, in addition to intergenerational changes tracking economic growth, people with greater access to fresh water, who have fewer children, and who have had access to basic schooling for several decades were more individualistic in orientation (i.e., more likely to emphasize personal autonomy) compared with people in countries where there was less access to fresh water, who had more children per family and who had no—or less prolonged—access to basic schooling. While people all around the world tend to report that their family is very important to them, people in richer countries (or in richer areas *within* countries) place special importance on leisure and time spent with friends whereas people in lower-income countries (or lower income areas *within* countries) place special importance on work and religion (Inglehart, 2018). There were also marked differences in tolerance: divorce, occupational opportunities for women, homosexuality, abortion, and educational opportunities were all more tolerated or encouraged in richer as opposed to poorer countries (or richer as opposed to poorer areas *within* countries) (Inglehart, 2018).

2.1.3.1 Increases in the Standard of Living

About 12,000 years ago, at the earliest stages of city growth in human history, the population worldwide is estimated to have been about 5 million (West, 2017). A full 10,000 years later (~1 CE), the population of the globe had grown about 50 times larger and stood at about 250 million people. This is substantial growth. But it was nothing compared to the growth that has occurred in just the last 200 years. By 1800 there were about 1 billion people on the planet, 2.5 billion by 1950, 6.7 billion by 2007, and there will be an estimated 9.2 billion by 2050 and 12 billion by 2100 (West, 2017).

Yet, only recently, during the 200-year stretch since the industrialization of the 1800s, economies around the globe have grown super-exponentially if, albeit, unevenly. Using the scale of 2011 international dollars, the wealth of the whole world amounted to around 1 trillion dollars in 1800 CE, 10 trillion in 1900, and nearly 110 trillion in the early 2000s (Roser, 2013). This gain in wealth has, indeed, been concentrated among a small proportion of economic and political elites—particularly in Western countries, since the widespread outsourcing of manufacturing jobs to developing countries beginning in the 1970s (see Nielsen and Alderson, 1997). Still, despite this, all income brackets have benefitted substantially, if disproportionately—income per person has grown at an accelerating

pace worldwide since 1800 (Roser, 2013). Most importantly, extreme global poverty has dropped precipitously during this period (Roser and Ortiz-Ospina, 2020).

In my experience, “scholars of inequality” in sociology do not pay enough attention to the difference between economic poverty and economic inequality and they rarely concern themselves enough with the apparent paradox that—around the world—poverty has declined while inequality has risen since 1800 (see McCloskey, 2016; Rosling et al., 2018). If we care about quality of life and economic opportunity, we should be more concerned with poverty than with inequality. Living in poverty means starving or sleeping outside or dying from disease-bearing water. By contrast, living in conditions of economic inequality means that some people have more than others. These are very different things! I insist that this is an important difference, even if sharply rising inequality has its own important problems (in terms of people’s optimism about the future, or trust in elected officials). We cannot become so confused about economies that we conclude they operate in zero-sum fashion—rising inequality does not necessarily mean more people are living in poverty. Luckily, undernourishment and deaths as a result of starvation worldwide have declined steadily, especially since the mid-20th century (see Pinker, 2018 for a review). Food insecurity is highest in South Asia and in Sub-Saharan Africa, but trend lines are clearly downward.

Since 1800, average life expectancy worldwide has grown from under 30 years (!) to about 70 years, and people in rich countries in North America and Europe regularly live into their late 70s and beyond. Some countries in Africa, such as Ethiopia, have life expectancies lower than 70 years, but life expectancy in all countries on the continent is growing with increasing rapidity. Concomitant worldwide declines in child mortality, infant mortality, and maternal mortality have contributed to this aggregate increase in life expectancy. While core infrastructural innovations are the ultimate, distal, cause of this increase in life expectancy—the treatment of water with chlorine, alone, has saved hundreds of millions of lives—more targeted treatments and vaccines for smallpox, measles, diphtheria, bacterial infection, and other common ailments have saved, in total, no less than five billion people’s lives thus far (Pinker, 2018).

People since 1800 are not just more likely to survive, but to flourish and self-actualize. McCloskey puts this into perspective:

“Donald Boudreaux lists the items that in 1965 only [a] few [billionaires] could have that by now every middle-class [person] has—overnight package delivery...long international telephone calls, large-screen viewing facilities in the home, international cuisine, a car for everyone in the household over fifteen, foreign vacations, a dishwasher, quickly developed photos (not instantaneous, and e-mailable), central air conditioning, not to speak of items unavailable even to [the richest

people in 1965]—soft contact lenses, Viagra... or...Lexapro and Paxil for depression.”

(McCloskey, 2016, p. 633)

To these gains, we ought to add gains in literacy, birth control and contraception, educational opportunities for women and the poor, and unprecedented opportunities for entrepreneurialism via streaming and file-sharing on the internet. These, and other, indicators of opportunity are often measured by the United Nations (UN) and World Bank as indices of “human development,” and such indices are very clearly—and strongly—correlated with the level of energy capture in a society. That is, the more efficient and productive a society’s energy infrastructure, the more opportunities people tend to have to self-actualize and flourish (Smil, 2017; Inglehart, 2018).

This does not mean that every society with high levels of energy capture are equally conducive to increased opportunities for self-actualization; the US, for instance, has relatively high rates of infant mortality and lower life expectancy compared with countries with similar levels of energy capture, for example, France, Japan, or Denmark (Smil, 2017). Several important points should be made about this. There is no *linear, inevitable* connection between increases in the efficiency and productivity of primary infrastructure (electrical grids, water treatment structures, underground cables, dams) and the degree of funding allocated to secondary infrastructures (social service centers, community centers, schools and other means of human capital development that rely on primary infrastructures). A country’s sheer size and degree of demographic diversity influences peoples’ levels of social trust and sense of national unity, which in turn, has effects on the economic policies which tend to be adopted (Eger and Breznau, 2017). It is not that a diverse country like the US cannot have lavishly funded secondary infrastructures, rather, it is that such funding will tend to be more heavily politically debated because the nation as a whole will tend to appear fractured and devoid of shared goals and concerns—*especially* when political leaders leverage demographic diversity (e.g., immigration) to stoke populism and distrust among country majorities (Helbling et al., 2013; Koopmans and Schaeffer, 2016).

2.1.3.2 Democracy

As I discussed above, Greece pioneered democracy in some significant ways—for example, in direct local decision-making by councils of people engaged in open debate, and in the Socratic spirit of questioning taken-for-granted truths—but not in others, as women, the poor and immigrants were barred from participation (Ober, 2009).

The earliest shifts toward demographically representative democracy are better placed in the 17th, 18th and especially 19th centuries (Tilly, 2007). The English Puritan Revolution (1642–1648), the “Glorious Revolution” of 1688, and, of course, the French Revolution (1789–1799), among other revolts of the period, are commonly cited examples of middle class uprisings intensely motivated by a perceived moral need to demote the political power of blood-line royalty and military in favor of “the people,” (Ishay, 2008). By comparison, the stubborn moral boundaries of ancient Greek democracies limited true democratic participation, as women, racial minorities and immigrants were often only tangentially included in notions of “the people.” In Peter Singer’s (and, before him, August Comte’s) terms peoples’ “moral circles” had not yet sufficiently expanded (Singer, 2011; Comte, [1851–1854] 1975).

I have tried to develop Singer’s (and Comte’s) ideas in some of my own work, which you can check out, if you are so inclined (McCaffree, 2015; McCaffree, 2020). My reading of history, social psychology, and political science, is that empathy is caused by perceptual overlap. Perceptual overlap is simply the sharedness of identities and body movements, and perceptual overlap comes in degrees. Perceptual overlap is captured in our intuition that “to walk a mile in another’s shoes” confers empathy, although I suggest that “walking a mile” need not involve an actual living of another person’s life, but can be done symbolically, abstractly and remotely, if to a less potent degree, through education and access to information. Because people can become easily emotionally overloaded at the prospect of living through another person’s suffering, more remote conduits of perceptual overlap—e.g., empathic, but accurate, portrayals of others in education or media—actually end up spreading more empathic concern among larger swaths of the population.

So, this means that primary infrastructure scaffolds the operation of *communication technology* from the telegraph to the telephone to the internet as well as *media technology* from the radio to television to YouTube, and that both communication and media technology have contributed to steadily rising empathy (by virtue of enabling exposure to different points of view and experiences, sometimes passively as with television, sometimes actively as with telephone or internet communication).

If you feel a critique welling up inside of you to the effect of “but empathy is not complete! People still suffer! People are still mean!” remember, the point is not that people no longer suffer or that all are now swelling with empathy. We must stay focused on the concept of *relative change*—for example, the world in 1800 CE, relative to 1800 BCE, contained a more shared notion of democracy and of universal human rights. The world has reached new heights of empathic regard as evidenced by, for example, the Universal Declaration of Human Rights in 1948, or in the late 1960s with the formal passage of civil rights legislation.

All of this is not to say that ancient people had no concept of human rights (see Ishay, 2008, for a tremendous review), or that modern people are emanations of a perfect ideal. It is to say that the institutionalization of formal, globe-wide, protections for human rights is, literally, unprecedented. Consider the so-called “International Bill of Rights” composed of the Universal Declaration of Human Rights, the International Covenant on Civil and Political Rights, and the International Covenant on Economic, Social and Cultural Rights (Buchanan and Powell, 2018). Or, consider the many associated treaties/“conventions” protecting human rights:

“the Women’s Convention, the Child’s Convention, the Convention on the Rights of Migrants and Their Families, the Torture Convention, the Convention on Ending Apartheid and Racial Discrimination, the Convention on the Rights of People with Disabilities, the Convention on the Rights of Indigenous Peoples, and the Genocide Convention.”

(Buchanan and Powell, 2018, p. 307)

These treaties/conventions serve many purposes (Buchanan and Powell, 2018). They specify processes for how human rights can be instantiated into law, how international and local organizations can monitor compliance with treaties, how courts can adjudicate human rights complaints/violations, how nongovernmental organizations can monitor (or report on) human rights violations, how “whistleblower” efforts can be legally protected, how country governments can bring existing law into accordance with human rights conventions, how countries can access loans or credit from the World Bank or some other source, how sanctions and other punishments can be levied on a country upon discovery of human rights violations, as well as how UN and member country military interventions can be used to safely diffuse regional conflicts stemming from state failure, terrorism, genocide and other atrocities.

Mere legal formalities are, to be sure, a far cry from effective enforcement of actual on-the-ground human rights protections. But critically, research shows that UN interventions during political crises or natural disasters are, quite often, effective arbiters of disputes between nations or between factions within nations (Pinker 2011; 2018). Human rights protections are not just words on paper. The ethical treatment of human beings around the world (and for that matter, of all animals if we include global animal rights movements) has never before, in history, been so effectively monitored and enforced. I say this despite the litany of human rights abuses and various cruelties around the world—suffering is and remains immense, but the organizational and institutional response to such suffering has never been more globally coordinated or more effective.

Perhaps we can mark a qualitative shift in macro-moral development with the Universal Declaration of Human Rights in 1948 after the horrors World War II. If so, this shift was only one of degree; it extended a long tradition of incremental developments which occurred much earlier, for example, with the Code of Hammurabi, Code of Lipit-Ishtar, Magna Carta, or institutionalization of English common law. Of course, classical Athens was also a milestone, of a sort, for democracy. Changes have indeed been incremental, but they have accelerated in the last 300 or so years (precisely as a result of some of the innovations in infrastructure that I describe here and, especially, in a subsequent book titled *The Dance of Innovation*). Had these infrastructural innovations happened earlier in human history, our moral circles would have expanded earlier. The institutionalization and protection of human rights is a stack of cards wavering atop a precarious infrastructural system that provides the electricity, water, nourishment and safety necessary to challenge our parochial intuitions.

Today, democracy is ascendant, and autocracy is in decline. Equal treatment under the law is ascendant and legalized discrimination is in decline. One cannot rely merely on their intuitions about this, informed by *The New York Times* or by academic social scientists, who are sometimes quite eager (probably out of sheer ignorance) to distort the reality in order to garner attention, appear relevant, and/or provide cover and emotional energy for social activism (see Goldberg, 2020). Our collective biases toward negativity and threat-avoidance can become all too easy for media and academics to exploit—indeed, some “social scientific” theories of the world are so cynical, misinformed and anti-intellectual that, if widely accepted or used to inform public policy, severe threats to civil liberties and continued moral progress might result (see Pluckrose and Lindsay, 2020).

However, my generally optimistic tone in this section should not be taken as evidence of a disinterest in activism or in furthering our collective appreciation for the importance of human rights. No doubt, some will read this and conclude that I am content with protections of human rights as they are, and that I disdain, or find unnecessary, further progress. These readers would be mistaken, I hope obviously so. My point is that, on matters as important as these, we must keep our feet firmly planted to the empirical ground—data and evidence must be our guide, not our easily inflamed and misdirected emotional hunches. No, autocracy and discrimination have not dissipated (nor for that matter, have people’s private prejudices, which are probably the last to go), but the evidence for profound, relative, improvements over time is utterly undeniable to serious observers (see Pinker, 2018; Shermer, 2015; Rosling, 2018; Buchanan and Powell, 2018).

Let’s look at trends in democracy worldwide, as an indicator of this moral progress.

Democracies and autocracies come in many forms (Roser, 2018). While all autocracies limit or exclude participation of the public in policy decisions (some more than others, Singapore, for example, is something of an outlier), some democracies are more direct (Switzerland), while others require the public to vote for representatives who will allegedly act in the public's interest (US). Some democracies enforce laws protecting human rights more often than others (compare Denmark's democracy with Pakistan's). And, certainly, there is a great deal of variation in the degree to which people are satisfied with the democracies within which they live; 58% of people in the US are currently dissatisfied with how their democracy works, 64% of people in South Africa are currently dissatisfied, and 84% of people in Greece are currently dissatisfied (Kent, 2019). Even in Sweden, 30% of the public is dissatisfied with their democracy (Kent, 2019).

Political systems are always developing, always capable of improving, and it is dissatisfaction and social movement activism that can change the course of political systems for worse or (hopefully) better. Yet, to the extent that we can agree that democracies are better than autocracies—that is, more conducive to the institutionalization of civil rights—then a rising prevalence of democracies around the globe is a good sign. Compared with autocracies, democracies on average provide more educational opportunities, better healthcare, more opportunities for economic mobility, better political representation, better protection of civil rights and they even go to war less often, in part, because the public is rarely eager to send their children off to the front line (Pinker, 2011; Roser, 2018).

If we combine autocracies into a single category, and do the same for democracies, we find that a majority of the world's nations are now democracies (Roser, 2018). In fact, the number of autocracies worldwide was surpassed by the number of democracies in the year 2002, and the trend lines have continued to diverge ever since. As of 2018, 99 nations around the globe were democracies, compared with 80 autocracies (Roser, 2018). This is still a very large number of autocracies, no doubt, but autocracies have been in steady decline since the end of World War II.

Today, over half of the people on Earth live in democracies—outside of small-group foragers and their egalitarian ethos, nothing like this has ever been achieved before in human history. And, although caveats always abound, these democracies have never been more inclusive of women, race/ethnic minorities, and immigrants. Considering that the oldest democracy on Earth is only a little over 200 years old, this progress must be regarded as, to some extent, fragile and in need of constant defense.

2.1.3.3 Macro-Societal Moral Development

The more that people migrate to cities in order to seek work, the more their familial and village ties became strained. People migrating to cities

find themselves among anonymous others in areas booming and bustling with opportunity, but often, with little if any safety net for protection during periods of unemployment, ill-health and poverty.

Social welfare “safety nets” for those facing the vicissitudes of poverty and ill-health in growing cities were initially provided by churches and fraternal associations that were often tied to particular occupations or ethnic groups (Hechter, 1987; Zuckerman, 2002). While churches had long provided social support for their congregants, urban fraternal associations were a new, more secular, safety net. Fraternal associations did indeed have rules, specifically, that financial support would not be provided to members whose joblessness or maligned plight was due to their own criminal behavior or drug addiction (Hechter, 1987). However, so long as association members could show some record of paying dues, working jobs, and being upstanding members of their communities, fraternal associations took care of people when times turned tough.

These fraternal associations, colloquially known as “friendly societies,” were, by the 1800s, formally recognized by British government officials as critically necessary organizations for mitigating urban poverty (Hechter, 1987). The growth of these associations was slow and steady—by 1801 in Britain the typical club had 90 members, and this increased to 132 members by 1875. Membership grew because leadership recruited people regardless of their social class and because official leadership positions were rotated regularly, preventing despotism or excessive parochialism. The colloquial “friendly societies” is apt because this is indeed what they were: non-kin friendships in an urban ecology increasingly bereft of strong ties and strong sources of social support. Michael Hechter describes the friendly societies/fraternal associations as follows:

“Publicans gladly offered their taverns as meeting sites...Additional benefits commonly included ‘medical attendance’—the right to take advice from a ‘medical officer’ who was employed by the society on a contract basis—educational benefits (some groups...provided classes in a variety of subjects and published magazines that encouraged educational development of their readers) and, not least, entertainment. The societies held monthly meetings...a gala annual feast (which many considered to be the most festive holiday of the year), and sometimes summer excursions...For most members such goods were unavailable elsewhere.”

(Hechter, 1987, p. 114)

Yet, because these friendly societies were, at least to some degree, selective, providing assistance only to their members (and because membership was restricted to physically healthy “upstanding” citizens), the broader folk sociological intuition that the nation is a *big person capable of big forms of*

care/nurturance, was becoming harder to resist, and people from all walks of life began demanding a national safety net, which we today call the “welfare state”. At the same time, government officials fretted over the urban poor’s possible revolutionary aspirations, as the urban voting bloc was growing at an unprecedentedly rapid pace. (Hechter, 1987). The combination of these two concerns—urban poverty and the potential for revolutionary fervor on account of this poverty—was a motivation for political elites to consider the import of government assistance that, in principle, would be available to all citizens.

Social welfare spending, as we would understand it today, was something like 0% in Western nations in the early 19th century. Today, social spending constitutes nearly a quarter of the average OECD country’s gross domestic product (Pinker, 2018). Social service spending began to rise first in Sweden around the year 1900, but after 1930 and especially after 1960, social spending was clearly rising in Japan, Canada, Australia, the US, United Kingdom, France, Italy, Greece, Germany, and many other countries. This was *net growth* in social spending, not necessarily linear growth—Sweden’s welfare spending as a percentage of its GDP, for example, declined somewhat in the late 1980s before rising afterward.

National governments that are less rich—for example, those in India, China, or Mexico—also tend to spend less money on social services, but even among poorer governments, the proportion of GDP spent on social services is generally rising. Mexico’s government, for example, spent 500% more on social services (as a proportion of its GDP) in 2012 than it did in 1985 (Pinker, 2018). Social spending in Turkey, as another example, grew by over 400% across the same period, rising from 3.16% of GDP in 1985 to 13.51% by 2014 (Ortiz-Ospina and Roser, 2016). No social trends are ever linear (because social systems are multi-level systems), so we must always keep in mind a prior baseline. Perhaps the most telling baseline would be the amount spent on social welfare circa 1800s—which country today spends less on social services than they did in 1800? 1850? 1900? 1950? Good luck finding one.

These increases in social spending are mostly driven by spending on healthcare and public education (Ortiz-Ospina and Roser, 2016). This sounds quite benevolent, does it not? As though political elites suddenly developed an empathic concern for their people? Well, maybe they did, in part because there was, certainly by the 1960s, an immense number of novels and political tracts written about the plight of the working class, women and the poor. There is persuasive evidence that literary depictions of maligned and marginalized groups served to open elites’ eyes to a degree of suffering previously hidden from them (Hunt, 2007).

We do not, however, *need* to presume an empathic awakening on the part of political elites. Simply put, political elites could no longer ignore the growing impact middle and working class people (as well as the cities

they inhabited) were having on national economic growth and innovation, and the healthier and better educated the masses were, the more they worked, the smarter they worked, and the more often they proffered innovations in technology and infrastructure. Once again, zero-sum intuitions do not help us here: social spending benefitted economic and political elites as well as the middle class, working class, and poor people. Even if this benefitting was asymmetric, it was not zero-sum, and this is an immensely important distinction.

Investments in public safety have also had a profound impact. Taking the US as an example, we can observe that, since the 1920s, motor vehicle and pedestrian deaths, deaths from drowning or fire, deaths from occupational accidents, and deaths from natural disasters have all steadily declined (see Pinker, 2018). The national violent crime rate in the US and in many other OECD countries has also been falling since the 1990s (Zimring, 2006; however, the reliably misinformed cynicism of some activists and their recent calls to “defund the police” promise to reverse this progress, thus harming precisely the groups they think they are protecting). Worldwide, the number of countries abolishing the death penalty has grown dramatically since the 1970s and the number of prisoners executed has fallen just as dramatically. Relatedly, worldwide, policies protecting human rights are becoming more prevalent, and better enforced (Fariss, 2019).

This moral progress appears to be part of an extension of moral consideration to groups of people previously systematically disenfranchised. For example, until 2015, hate crimes against a variety of groups had been in decline or were stabilizing at low levels since the end of World War II. Post-2016 data on hate crimes is oddly unreliable, and this unreliability seems to be a result of two developments: (1) US President Donald Trump’s consistently nationalist rhetoric; and (2) news media’s disingenuous search for shocking, often misleading, news stories (beginning pre-Trump) about immorality, from racism to sexism to ableism to transphobia (see e.g., Goldberg, 2020). This shift of progressive-left news outlets to focus more on instances of personal morality (often regarding nonsensical indiscretions, such as instances of “cultural appropriation”) is analogous to the shift by the Evangelical Christian political right to embrace conservative moral issues in the 1980s and 1990s.

The media environment in rich societies is one wherein accusations of victimization become more encouraged and more rewarded this is because the rarer instances of discrimination become, the more extreme and newsworthy they seem (Campbell and Manning, 2018; Levari et al., 2018; Haslam et al., 2020). When injustices and indignities are common, people regard them as a fact of life to be navigated; when injustices and indignities are less common, we insist on complete and total eradication of all instances. In other words, the more moral a society becomes, the more

outraged people become by perceived immorality, and the more people will compete to be known as vanquishers of injustice. This suggests that so-called racial and gender “*micro-aggressions*” (Sue, 2010) are monitored in schools and business places precisely because racial and gender *macro-aggressions* have never been so rare.

For example, we can look at data on Google searches for sexist, racist or anti-gay jokes, all of which are down compared with the early 2000s (Pinker, 2018). Racist terrorism in the US, such as the raiding of black neighborhoods or the lynching of black people, took place *three times a week* on average in the late 1800s but has thankfully become far less common. And rates of violence against women are at historic lows, not just in the US but across democracies around the world. Pinker summarizes these changes:

“In 1950, almost half the world’s countries had laws that discriminated against ethnic or racial minorities...By 2003 fewer than a fifth did, and they were outnumbered by countries with affirmative action policies that *avored* disadvantaged minorities. A huge 2008 survey...of twenty-one developed and developing nations found that in every one, large majorities of respondents (around 90% on average) say that it’s important for people of different races, ethnicities and religions to be treated equally...With women’s rights, too, the progress is global. In 1900, women could vote in only one country, New Zealand. Today they can vote in every country in which men can vote but one, Vatican City. Women make up almost 40% of the labor force worldwide and more than a fifth of the members of national parliaments...[Most people around the world] believe in full equality for men and women, with rates ranging from 60% in India...to 98% in Mexico and the United Kingdom.”

(Pinker, 2018, p. 222)

We can add further improvements to this promising picture. The number of countries around the world that have formally decriminalized homosexuality rose from under ten in 1850 to over 100 today. Rates of child labor are also declining all around the world. For example, in 1880, about 65% of children in Italy were listed as laborers compared with about 3% in more recent years (Pinker, 2018).

Opportunities for occupational and personal development can be assessed in other ways as well, for example, by looking at rates of literacy and schooling. From the US to China to Sierra Leone, the number of years of schooling the typical child receives has been growing since World War II. Female literacy rates—a good indicator of opportunities for women—are rising worldwide, as well, albeit along with countries like Pakistan and Afghanistan which still have fairly low (though rising) literacy rates. More

and more, people around the world can spend their time in schools and homes with electricity, reading, learning, and using the internet to search for jobs and community. The proportion of people’s disposable income needed for necessities (food, transportation, clothing, housing, utilities, gasoline) has declined, and by some estimates, the price of utilities such as energy for domestic use has fallen 12,000-fold since around 1300 CE (Pinker, 2018).

On top of people becoming better educated, more literate, more likely to survive childhood, and more materially comfortable, people are also enjoying greater amounts of leisure time. Men and women reported around 32 and 30 hours of leisure time per week, respectively, in 1965; by 2015 this had grown to 41 hours for men and 35 hours for women. It seems the lower number of leisure hours for women is due to their still shouldering more of the child-rearing and household upkeep than their male partners (while, at the same time, participating in the labor force at unprecedented rates). Still, time spent doing housework has declined for women, as well, thanks to the advent and development of dishwashers, vacuum cleaners, refrigerators, running water, electricity, microwaves, ovens, and other utilities and appliances which, collectively, freed many women from the servitude of full-time house maintenance. Specifically, the number of hours spent on housework per week declined from over 60 hours in 1890 to around 15 hours in 2015 (Pinker, 2018).

And what are people doing with this increase in material security and leisure time? They are traveling more (the cost of air travel has declined steadily since 1980; the number of people engaged in international tourism has risen steadily since the early 1990s) and pursuing an increasingly large volume of opportunities for self-actualization and economic growth (e.g., higher education, entrepreneurialism). Indeed, composite well-being indices (which include estimates of a country’s homicide rate, GDP per capita, real wages, life expectancy, average years of educational attainment, etc.) clearly show that wellbeing is increasing over-time (Rijpma, 2014). Since 1950 especially, gains in wellbeing have occurred all around the world, although they are occurring more slowly in Sub-Saharan African countries, Afghanistan and Haiti (Rijpma, 2014).

It is often said that “money doesn’t buy happiness,” but this clearly ignores the fact that money can buy food, housing, clothes, basic appliances, housing, and medical care. Every time I hear someone tell me that “money doesn’t buy happiness,” or that there are “more important things in life than money,” I know immediately that I am talking to a financially comfortable person who has been comfortable for some time. This person might not be rich, but they’re sufficiently removed from the realities of raising kids or finding work when food, clothes and a roof over your head are uncertain luxuries. It seems to be true that the richer a country gets, the less income or wealth correlates with peoples’ individual sense of life

satisfaction—perhaps, there is some truth in the adage that the more we get, the more we want (the so-called “hedonic treadmill,” see Brickman and Campbell, 1971). Yet, the line between a life dominated by starvation, dehydration, homelessness and death, and a life where these can be avoided (or people can be paid to assist with them) is a bright line; it is an incremental, but qualitative change.

Again, my optimism should not be evidence of some naivety or lack of interest in justice—easily the most frustrating thing about talking honestly on these topics is that anyone can point to some atrocity and lazily say “but, what about *this* injustice? How can you overlook *this*?” It is as though no one can speak honestly about moral progress without constantly reminding people that they are also aware—and genuinely bothered by—all of the litany of atrocities and indignities that remain with us today.

So, no, we have not made anywhere near enough moral progress and probably never will. At least 734 million people are currently living in extreme poverty (less than \$1.90 per day) (United Nations, 2020)². The COVID-19 pandemic, the collapse of financial markets, climate change, and other disasters, both present and future, will always pose risks to global economic growth. There is still plenty of suffering on Earth. Pinker, ever the magnet for criticism as being an excessive optimist, puts the matter succinctly:

“Seven hundred million in the world today live in extreme poverty. In the regions where they are concentrated, life expectancy is less than 60, and almost a quarter of the people are undernourished. Almost a million children die of pneumonia every year, half a million from diarrhea or malaria, and hundreds of thousands from measles and AIDS. A dozen wars are raging in the world, including one in which more than 250,000 people have died, and in 2015 at least ten thousand people were slaughtered in genocides. More than two billion people, almost a third of humanity, are oppressed in autocratic states. Almost a fifth of the world’s people lack a basic education; almost a sixth are illiterate. Every year five million people are killed in accidents, and more than 400,000 are murdered.”

(Pinker, 2018, p. 325)

Let’s add more misery to this list. Suicides remain troublingly high, global temperatures are rising, authoritarian leadership—and the populism it relies on—might be growing, prescription drug abuse is rising, and corporate profits remain astronomically high while some can barely afford healthcare. I, for one, would add something of an existential loneliness too—people in modern cities complain often about tribelessness or a certain lack of closeness with others in shared pursuits (Cox, 1965; Berger et al., 1973).

Despite the immense—truly, utterly, immense—suffering that exists in the world today, we must be honest also about the moral progress that has occurred. I suggest that moral progress, to the extent that it has occurred, has occurred in six overlapping forms (on this, I am drawing from Buchanan and Powell, 2018). Let’s take a look at each.

First, we see “better compliance with valid moral norms,” (Buchanan and Powell, 2018). This means that more and more people around the world are treating those outside of their inner family or religious/ethnic circles with respect and dignity. Indicators of this form of moral progress involve declining homicide rates within countries or better enforcement of human rights laws across countries (as with the World Health Organization or the UN).

A second form of moral progress has occurred owing to the development of “better moral concepts” and more complex moral motivations (Buchanan and Powell, 2018). This occurs as people begin expanding the horizons of their moral concern to include those outside of their particular family, community, race/ethnicity or nation. It is not that family, community and so on cease to be important objects of moral concern, rather, it is that people lose arbitrary beliefs about the superiority of *their particular group*. Any human being, in principle, can suffer, and people of different race/ethnicities, religions, nationalities, etc. love their family and friends, just like we do. Like us, most people all around the world are trying to better themselves and make their family and friends proud of them.

This expansion in moral motivation produces and is produced by increased complexity in moral reasoning. Examples might be the distinction between pre-emptive and preventive war, or, this might involve considerations of intent during criminal trials instead of only considerations of outcomes/effects. Or, it might involve the development and enforcement of new moral norms, such as those prohibiting sexual harassment, stalking, or child abuse. Another example might include the right to a trial by evidence for people accused of crimes, instead of assuming culpability owing to the offender’s family history, personal beliefs or apparent possession by demons or devils. A related example is the growing worldwide concern with condemning people to death row on merely circumstantial evidence.

A third form of moral progress occurs via the “better understanding of...virtues,” (Buchanan and Powell, 2018). Human beings, to varying degrees in various societies, have always endorsed sets of virtues or values like honor, dignity, loyalty, or respect. Yet, some societies at some points in their history, and no doubt in response to various perceived threats came to *over-value* certain concerns. During periods of lawlessness, poverty and isolation, expectations for honor, loyalty, or respect can constrict people’s freedom of choice, belief, or personal autonomy and, thus, increase violence or oppression. Honor cultures, for example, are very focused on respect, loyalty, and a swift response to perceived threats or slights

(Nisbett and Cohen, 1996; van Osch et al., 2013). These cultures are often very violent, and people are often pre-occupied and anxious about stepping out of line. Not surprisingly, honor cultures are found around the world among livestock herders who live isolated, often impoverished lives.

Meanwhile, in societies where individuals are wealthier, better integrated into an economy, and better protected by local or state governments, people often expect themselves and others to adhere to fewer, more relaxed norms (“loose cultures”, see Gelfand et al., 2011). Popular values in these societies are typically those that extoll creativity, innovation, self-development, and self-expression. However, just as the values of honor, loyalty, and respect can become pathological under extreme conditions, so too can *over*-valuing individualism and self-expression lead to non-optimal outcomes. Perhaps the most accessible example of this is a family all staring at computer/phone screens quietly at their dinner table primping and preening their online social media profiles, instead of building relationships with one another. Another example is the person who spends so much time preparing for, and then developing, their personal career that deep friendships, parenthood, and other cornerstones of human experience come to be seen as burdens.

A “better understanding of virtues” is thus represented in our growing tolerance for, and appreciation of, honor, loyalty, and respect without the stifling of creativity and personal expression. Just the same, creativity and personal expression are important, but not to the point that they contribute to the loss of a sense of community and respect for (legitimate) authority. Fission-fusion oscillations can leverage the virtues of honor, loyalty, and respect without excessive intrusion of the correlated downsides of lost individuality and innovation; such oscillations can also leverage the virtues of individuality and innovation without the correlated downsides of loneliness and isolation.

A fourth form of moral progress is “demoralization” (Buchanan and Powell, 2018). Demoralization occurs when some belief or behavior regarded as immoral in past eras is no longer considered in moralistic terms. Over the last several thousand years, and especially the last several hundred years, demoralization has occurred with regard to “lending money with interest, masturbation, pre-marital sex, same-sex sexual relations, interracial marriage,” and to this list we might add women working outside the home or learning to read, singlehood or childlessness, substance abuse/drug addiction, divorce, mental illness, and so on (Buchanan and Powell, 2018, p. 56). Some of these are an interesting case where apathy has been a form of moral progress—simply not giving a damn about who people want to marry, who is masturbating, or who wants to get divorced can be regarded as a form of moral progress. In the cases of drug addiction, disability or mental illness, apathy seems to be playing less of a role. Instead, in these cases, it seems as though people who would have in the

past been regarded as morally degenerate are now being treated concerted with dignity and moral worth.

A fifth form of moral development is “moralization,” a mirrored reverse of the “demoralization” process discussed above. Moralization occurs when behaviors or beliefs previously regarded as morally neutral come to be seen as morally significant. We see this in the moral condemnation of “foot-binding, dueling, female genital cutting, unwanted sexual advances in the workplace, nonconsensual sex with one’s spouse, extremely cruel punishments, torture, deliberate infliction of pain on non-human animals...” (Buchanan and Powell, 2018, p. 57). The many practices—from war and colonialism to slavery to domestic violence to child abuse to wage-theft in the workplace—which had not been seen as morally relevant in the past, but which came to be seen as obviously immoral, are instances of moral development.

A sixth form of moral development involves “improvements in understandings of the nature of morality,” (Buchanan and Powell, 2018). After all, what is “morality”? Is it an ancestral essence? Is it a result of proper religious adherence? Is it a coldly rational response to a world composed of competition and finite resources? A feature of individuals’ “character”? For the vast expanse of human history, morality was thought to be determined by ancestry, intuition, or by adherence to sub-cultural rules and rituals. It appeared to early anthropologists as though each society had a morality peculiar to it, as though there were no “universals” underlying human morality. Also, throughout history, many accusations of immorality have been little more than absurd stereotypes, as when entire groups of people are dehumanized as witches, demons, devils, insects, rodents, or oppressors and then violently persecuted and tortured.

In hunter-gatherer societies, “moral” acts were pro-social acts: do not steal, do not hurt others, respect tradition/ritual and help out with food collection, defense and childcare to the degree that you are able. These are humanity’s “moral origins” (Boehm, 2012). Sure, hunter gatherers have their fair share of bizarre beliefs in witchcraft, black magic and the “evil eye,” but much of their sense of morality is strikingly recognizable to any modern urbanite. In fact, recent cross-cultural anthropological work has settled on the following universal components of morality: love for one’s family, helping others, returning favors, acting with courage/dignity, deference to legitimate authority, fairness in exchanges and relationships, and respect for other people’s property (Curry et al., 2019; see also Brown, 1991).

Psychologists Paul Bloom, Karen Wynn, and others have provided evidence for the foundations of these moral sentiments in even pre-linguistic infants (using sock puppets to simulate interactions between agents, see Bloom, 2013; Bloom and Wynn, 2016). In fact, a recent meta-analysis of 26 studies found that nearly 70% of infants between the ages of four

months and 32 months, “showed a preference for a morally good agent (helping, fair or comforting) over a morally bad one (hindering, unfair or hurting),” (Margoni and Surian, 2018, p. 1451). People around the world are becoming increasingly aware of the actual foundations of morality—and it is not primarily some intrinsic virtuous character, some benefit of good ancestry, or cunning reasoning. Rather, moral sentiments are an evolutionary pre-condition for social coordination—they are the emotions and intuitions which help ensure that groups stay together and that group members are protected and cared for.

Humanity’s very capacity for empathy and altruism can be located in the same basic physiological architecture found in other mammals and birds that tend to their young (Churchland, 2011; Preston, 2013). In order to routinely and attentively care for offspring, animal species must have the ability to take the perspective of others (in order to identify suffering or neediness), and they must be capable of exerting the cognitive control necessary to differentiate between self-feelings and the feelings of others (Decety, 2007).

Clearly, however, this intuitive empathy and altruism does not easily or automatically extend to out-group members. For out-group empathy, we need the variables discussed above: improvements in basic survival-relevant infrastructure that reduces people’s objective poverty, improvements in communication and transportation infrastructure which place people into contact with diverse others, improvements in literacy and in education, and a spread of built ecologies conducive to fission-fusion oscillation (i.e., cities).

Moral development within and between societies is not some inevitable, linear, historical progression. Societies collapse, and when they do, they often do so slowly and incompletely (Tainter, 1988; Turchin, 2016): political conflicts become more intractable, clashes between factions in the public become more common, the legitimacy of leadership and of law and order declines, trade relationships fray, markets become more tumultuous and unpredictable. If we intend to discuss morality at the level of the society or nation-state, we must look at societal instability and collapse as threats to the *capacity and motivation* for people to expand their spheres of moral concern to outsiders. Depending on the damage done to infrastructure as a result of these political and public conflicts, survival could become more difficult, communication and transportation technologies could break down and erode, and civil services could become under-resourced or less reliable. Societal collapses represent not only declines in institutional complexity but also a shrinking of our spheres of moral concern; all of the above are relatively new, and hard-won, understandings of the nature of morality.

2.1.3.3.1 “Progressophobia”

Especially since the 1960s academics have been skeptical about claims regarding moral progress. History, up to the present second, seems absolutely riddled with indignities and inequalities. Each and every day we hear news stories about children being trafficked, people dying from disease and deaths in war. Is it not a little pollyannish to be discussing (slow, non-linear, reversible) moral progress? What about all of the suffering in the world? I mentioned this above, but let’s delve a bit more deeply into people’s stubborn desire to avoid conversations about moral progress, or their “progressophobia” to borrow a phrase used by Pinker (2018).

Buchanan and Powell (2018) helpfully discern some common reasons why people—in particular social scientists and humanities professors—reject the reality of moral progress over the broad expanse of human history. First, and for good reason, our cultural memories about the horrors of genocide, political corruption, state failure, and terrorism are acute. No matter that war deaths, as a proportion of the population, are declining over at least the last 70 years; the vivid horrors of fascism, slavery, eugenics, and other atrocities are impossible for decent people to not care about.

As I have tried to repeatedly emphasize (and will continue to do so on account of its importance), we human beings, like all organisms, are threat-sensitive. Organisms especially alert to dangers and risks are more likely survive and reproduce compared to organisms that are less alert. Our evolutionary inheritance is a mind calibrated to the detection of threats in our environment, be they natural or social (Baumeister et al., 2001; Boyer et al., 2015).

Two quirks of our perception follow from this threat sensitivity.

For one, we are often more attentive to social problems than to social progress. We notice, and focus on, the broken gas line that destroys people’s homes, but we pay less attention to the much greater numbers of people that can heat their homes and thus survive blizzards using the very same natural gas. We notice, and focus on, the dozens of innocent people gunned down by police each year and ignore the millions and millions of positive (or, at least, not negative) police-citizen interactions occurring every day. As Buchanan and Powell (2018, p. 4) write, “Moral progress, then, is like oxygen: when it exists, we don’t tend to notice it, even though our well-being depends on it.” I readily accept that our hyper-focus on threats is itself an important driver of moral progress, but when this hyper-focus leads us to cynically dismiss the existence of moral progress, it is doing more harm than good; it is depressing us more than encouraging us.

Second, as I said above, the less often an atrocity occurs, the more outraged we become when it does occur (Sunstein, 2018; Haslam et al.,

2020). This means that in societies where hostile sexism and racism occurs rampantly and publicly, people's moral responsiveness to the cruelty of sexism or racism will be subdued. The mere regularity of an offense dulls the senses and, more tragically, people's expectations. By contrast, in societies where rampant sexism and racism are more rare, people will become hyper-vigilant to prevent it from emerging (or to eradicate it when discovered). There are, thus, more civil rights protests in contemporary democracies—and more *successful* protests—than in perhaps any societies in human history (Chenowith et al., 2011).

We should consider some other criticisms of the very concept of moral progress. Many critics insist that there is simply insufficient evidence to conclude that, on balance, there has been moral progress across human societies. Think of all the billions of interactions between people occurring each day. Can we really say with any clarity that these interactions are more moral or caring today than, say, 100 years ago or 1,000 years ago? In order to assert as much, would we not need to observe the totality of human interactions and do so over a long stretch of history? People are mean to each other all of the time—am I saying that, now, everyone is nice to each other?

No, I am not saying that. But, there is some substance to this critique. Any concept as expansive as “moral progress,” will come with countless qualifiers and caveats. Have scientists and historians shown definitively that societies around the globe today contain nicer more caring people? No. In fact, this might be impossible to do. But we can look at certain practices like slavery, witch burnings, or maternal mortality, and we can track their change in prevalence over time, for as long as data go back. It does seem that there has been an astonishing degree of moral progress, as I have described above but, of course, much cruelty and suffering remain—in an paradoxical sense, there might be *more* cruelty and suffering today because there are more people on Earth now than ever before in history.

And, of course, some aspects of progress come with downsides—the availability of food has made obesity among the poor (and others) a public health concern, but such a concern would be impossible for most of the societies of history where poor people might have outright starved. So, we must go on a case by case, issue by issue, government by government, basis and seek answers to the question: are more people surviving/being offered opportunities/being protected today compared to 50 years ago? 100 years ago? 5,000 years ago? The answer is undoubtedly yes, yes and yes, but this does not mean, as I have said so many times, that moral progress is inevitable or irreversible or total (i.e., occurring across all metrics simultaneously at the same rate).

A third criticism of the possibility of moral progress is how different people's subjective attitudes or opinions often are from one another (Buchanan and Powell, 2018). This social constructionist perspective

would hold that any cross-cultural evaluations of moral progress are unjustified and meaningless because of how subjective cultural experience is and because of how different (in terms of norms or myths or foods or music) societies can be from one another. There is really not much to say in defense of this critique—unfortunately for the hardline social constructionist, reality is not irreducibly subjective. Even if every child who dies of malaria or of dysentery or of HIV has an individual, highly idiosyncratic, experience of their disease, the actual number of children who die from these diseases is a countable, recordable number. And as morose as it might sound to “reduce” children dying from disease to a mere number, rate or ratio, this is one of the best ways to track improvements in care over time. So, is the experience of suffering and cruelty idiosyncratic and subjective? Absolutely yes. However, the consequences of suffering and cruelty are not wholly subjective, and objective measures of not only deaths or infections but also of various opportunities (political protections, educational access, job opportunities) can help us to get a handle on the existence of moral progress, despite our rich, inner subjective worlds.

A fourth criticism of moral progress is that the very concept is riddled with negative implications (Buchanan and Powell, 2018). In particular, imperialism and colonial takeovers have, throughout history, been motivated by the alleged moral superiority of the aggressor and the alleged moral inferiority of the conquered territory. Of course, we know now that people often find it intuitive that their country and customs should be superior to all other countries and customs. Human beings, across the globe and across history, appear to be prone to developing moral preferences for what they are socially familiar with (Brown, 2004). So, the critique is that, regardless of the reality of moral progress here and there, we should not bother using the *term* “moral progress,” because using such a term will only motivate people to construe their own societies as superior and thus attempt to justify aggression or discrimination towards people from other countries.

The problem with this critique is that it changes the subject. How the concept of “moral progress” is variously used as justification for people’s nefarious desires for power is quite a separate issue from the *de facto* existence of actual moral progress across various metrics. So, yes, people sometimes hide behind their supposed moral superiority in order to hurt or take advantage of others. I do not expect such a tendency to disappear anytime soon. Yet, we have to keep our eye on the ball—progress in human survival and flourishing is real, and not simply a matter of opinion. Certainly, we can find sadists in the world who wish only for more death, chaos, and destruction, but it seems fair to suggest that most people, most of the time, will be quite relieved that they did not die in childbirth or from disease in the prime of their life. Similarly, most people, most of the time, will be quite relieved to know of the available opportunities to learn

to read or write or go to medical school that, in prior eras, would not have been available.

Overall, we cannot really say that intellectuals *oppose* moral progress (many, perhaps most, sociologists consider themselves activists), but they are either deeply suspicious of it or do not often consider it. Quite often, fallacious, cynical, assumptions about modernity, industrial society, or “capitalism” plague intellectuals’ reasoning about societal change over time. Intellectuals—from Jean-Jacques Rousseau to Karl Marx or Max Weber to Paul Ehrlich—have railed against industrialized rich democracies for their materialism, competitiveness, inequality, and bureaucracy. Implicit in many such critiques of modernity—which might indeed have some validity—is the fallacious assumption that pre-modernity was a pure, unsoiled era replete with a kindness, fairness, honor, and moderation that we moderns would hardly recognize.

What these intellectuals do, unknowingly, is dehumanize people in eras before ours, construing them as somehow pure and not fully human, devoid of the pitfalls of human nature. It is similar to an “original sin” story in the realm of history and politics: where once people frolicked hand in hand, motivated only by love, now they toil in pointless jobs buried under materialist excess and false consciousness.

Suffice to say, there is much kindness, fairness, honor, and moderation in contemporary societies, and there was plenty of cruelty, inequality, and nefarious indulgence in ancient societies. We cannot forget that we are, after all, studying the very same human animal in classical societies that we are studying in contemporary societies. Humans are capable (and quite prone to) both kindness and cruelty, fairness and inequity, honor and dishonor, moderation and indulgence, regardless of the society they live in. We cannot allow ourselves to intuit some pristine, morally advanced human beings living in ancient societies and juxtapose this against supposedly corrupt, morally repugnant humans in modern societies. Just because we do not personally know historical peoples, does not necessarily mean they were superior to us or wiser than us (even if believing so allows us to compliment ourselves for our virtuous open-mindedness). And, let us not forget what classical societies lacked: civil rights, adequate medical care during childbirth or for disease, widespread literacy, formal schooling, reliably clean water, electricity, and so on. Yes, with modernity has come pollution, new forms of stress, a sense of community-detachment, and anomie, I could go on. The point is precisely to embrace this complexity, to reason through how society has changed over time, and to avoid assuming a peaceful, moral, pristine past juxtaposed with a horrific future.

At the risk of being reductive, I suspect that much of peoples’ skepticism toward the reality of moral progress is a result of their intuitions about capitalism and power. As I will be describing in greater depth in my follow-up to this volume (*The Dance of Innovation*), humans in the

evolutionarily recent economic environment of modern capitalism often rely on their intuition that “power” is a nefarious substance accrued in zero-sum fashion and enforced so as to exert pain, suffering, and exploitation on the poor and powerless. This is a very intuitive perspective to have; after all, we rarely know, *personally*, the people who work at our local bank, open a local business, manage the local Walmart, watch our kids for us when we are at work, provide our electricity, own the restaurants we go to, or make the cell phones we cannot look away from. In addition, much of what most of us know about “the rich,” comes from Hollywood depictions of lavish homes, boats, and cars, or, horror stories about investment failures and collapsed development projects. The result is a general cynicism, a general skepticism, about (large, anonymous) markets and about how wealth is generated—capitalism easily becomes everyone’s favorite punching bag.

Peoples’ intuitions about the nefarious evils of capitalism emerged just as early as capitalism itself. Here is the English cleric Robert Burton in 1621 (in a passage that I am borrowing from McCloskey, 2016, p. 301):

“What’s the market?...A vast chaos, a confusion of manners, as fickle as the air...a turbulent troop full of impurities, a mart of walking spirits, goblins, the theatre of hypocrisy, a shop of knavery, flattery, a nursey of villainy, the scene of babbling, the school of giddiness, the academy of vice;...every man is for himself, his private ends, and stands upon his own guard. No charity, love, friendship, fear of God, alliance, affinity, consanguinity, Christianity, can contain them...”

This sort of alarmism, with perhaps less emphasis on religion, can frequently be heard in humanities and social science departments to this day. It is the sort of alarmism people are prone to when they do not understand how something works and, as a result, attribute to it all of the ills that befall them or the people they love.

Large-scale markets across many different sectors generate wealth that, especially in modern nations, is impossible to fully track and predict. The transfer of money across many hands is also leaky, in the sense that various local, regional, state, and federal taxes are also drawn from these market exchanges for various infrastructural and civic purposes. All we notice are the very local exchanges—suppose I go to the grocery store and buy pretzels, milk, nuts, salad and chicken. I see all kinds of people in the store whom I do not know. The person who takes my money, I do not know them. Then I go home and turn on television or surf social media and see, to my bafflement and dismay, how many cars or boats (or whatever) the wealthy own and flaunt. What I do not notice is the rising bottom, I only see the glitzy top. I do not notice—indeed, I quite insistently take for granted—my health, fresh water, electricity, internet access, indeed, my very

access to a grocery store replenished regularly with immense varieties of fresh food.

Still, it is fair to ask: but, Kevin, why have large, multi-sector, mostly anonymous financial exchanges with others around the globe *not* caused great suffering? Why are they not marching us to an apocalypse? People do not care about people they do not know, right? People are innately greedy, right? What about all of the poverty, suffering and homelessness around the world?

Adam Smith ([1776] 1979) gives us part of the answer: happier customers means more business, and so businesses and countries are countries incentivized toward the goal of successfully satisfying customers and voters. Politicians and business owners who do not provide what the voter and customer want (or if someone else comes along and does their job/product better), tend to lose voters and customers. The lesson is that large economic markets are, often subtly and incompletely benevolent: they need for their vibrance and growth a large swath of the public with disposal income and many needs and desires along with entrepreneurs and politicians eager to compete to satisfy them.

Another part of the answer comes from Kitty Calavita (1984): with the rise of an influential middle class alongside a concomitant decline in monarchies and autocracies, national leadership started to become “a committee for managing the common affairs of the whole bourgeoisie,” not just elites (an observation made by, of all people, Marx and Engels [1888] 2002 p. 221). Political elites in democratic governments, in other words, came to realize that it was the common people—middle class and upper-middle class entrepreneurs in particular—who owned the very wealth that government needed to tax for its programs. No longer was it sufficient for a single royal family to depend on meager taxes from poor farmers. No, now a large swath of productive business owners, workers and entrepreneurs were needed to fund the infrastructure and services necessary for continued growth. A crucial role of the government becomes to facilitate business owners making money by providing various products to consumers. This is why, if poverty becomes too extreme or if markets become too volatile, we will, in democracies, tend to see corrective measures voted upon and passed, even when these measures draw tax dollars disproportionately from the very elites who typically benefit most from the economy. The fiscal health of the entire purchasing system, the entire market economy, becomes more important than any one family or set of families.

Put simply, the more the common woman or man *can afford* to purchase college, house, car, computer, and so on, the more money there is *to be made* from their purchases. Modern economic growth is predicated on more and more people having enough disposable income to make more and more purchases.

Using various case studies of immigration law over the last couple hundred years, Calavita (1984) makes the argument that capitalist democracies do not necessarily act legislatively in the interests of any one capitalist or their family, but in the general interests of business owners who draw profits from the normal people who comprise the bulk of the buyers in the economic market. If crime or violence prevents market transactions, it will be legislatively regulated; but, so too, if poverty or unemployment reduces the purchasing power of large swaths of people, this will need to be addressed at some level by the political leadership, so that a maximal number of people in society are making purchases, starting businesses, and generally contributing to the economy.

Attitudes towards the middle class actually quite closely track the exponential growth in economic productivity beginning in its early stages around 1600 CE. McCloskey writes at length about this period, and of how it marked a change in elite attitudes. So, why the takeoff in 1600? McCloskey refers to the following passage from Max Weber to describe the general attitude historically held by most elites toward innovators. Weber writes that the typical historical response to innovators, “was not generally peaceful. A flood of mistrust, sometimes of hatred, above all moral indignation, regularly opposed itself to the first innovator,” (as quoted in McCloskey, 2016, p. 154). She points out how prominent theologians and thinkers like John Calvin, Richard Hooker, and Jeremy Bentham variously referred to the desire to innovate as suspicious, notorious, disobedient or, for the iconoclast Bentham, “daring.”

For McCloskey, innovation and from the masses was looked down on for so long because doing so allowed elites to presume some special insight, wisdom, or ability for themselves. After all, they stemmed from a long royal bloodline of leaders—certainly this royal lineage was not an accident but a portent of skill and ability? I suspect that what steadily became undeniable as cumulative modifications to infrastructure accelerated standards of living and mass engagement in civic life, was that the masses also had good ideas, really good ideas. The capacity for insight could no longer be justified by royal bloodline the more literate, stable, and self-actualized the public became. Homer’s “Odyssey,” dating to 8th century BCE, contains passages depicting commoners and wage-earners as irrational and immoral. Within 3,000 years, in 1789, a bustling class of commoners comprising businesspeople, lawyers, doctors, artists, writers, and many others would spark a middle-class revolution in France that would change the world.

Notes

- 1 As a point of comparison, the typical population density of a modern metropolitan area in the US is over 6,300 people per square mile!

- 2 Extreme poverty is nevertheless becoming rarer and rarer—the UN documents a decline in extreme global poverty from 36% of the globe in 1990 to 10% in 2015, and this is projected to fall to 6% by 2030 (United Nations, 2020). It is now feasible that the UN will achieve its goal of “ending poverty in all its forms everywhere” (though we can expect the definition for what counts as “poverty” to continue to expand).

Evolutionary Sociology

We turn now to several of the more prominent theories used to explain cultural change over the last 12,000 years. We will begin here with evolutionary sociology.

3.1.1 Logistical Pressures and The Development of Societies

Turner (2010; 2018; 2020) conceptualizes societies as existing within inter-societal/international systems. And, if we zoom in on a particular society and open it up, we see the following large components: *stratification systems* (“identifiable subpopulations created by the unequal distribution of valued resources by institutional domains in societies”) and *institutional domains* (“culturally regulated congeries and systems of [organizations] dealing with selection pressures generated by...population, production, distribution, regulation, and reproduction”) (Turner, 2010a, p. 13).

Stratification systems inequitably distribute many different resources, for example, pecuniary resources like wealth or income (institution of economy), emotional resources like love/loyalty (institution of family), coercive resources like power (politics), physical resources like health (medicine) or social resources like learning (education). These varied kinds of resources across institutions helps to explain, for Turner, why Marx’s worldwide communist revolution has not come to pass, despite the existence of inequality or exploitation in the economy. It is not that people enjoy disadvantage or exploitation at work—rather, it is that there are other resources across other institutional domains that can help to give people a sense of purpose, meaning, and control.

Cultural “selection pressures,” for Turner, are those stresses and strains endemic to large social systems: pressures arising from inadequate levels of the production, distribution and regulation of goods and services. Turner conceptualizes these general stresses on social systems as “logistical loads” that, ultimately, determine the growth (if they are addressed and ameliorated) or

dissolution (if they go unaddressed, or poorly addressed) of a society (Turner, 2010a; see Figure 3.1).

Societies face logistical loads relating to population (supporting and/or integrating increasing numbers of people of various demographic compositions), production (acquiring enough materials for the creation of infrastructure, commodities, or services), distribution (ensuring the adequate and continual circulation of people and goods across space), regulation (ensuring some degree of concentration of power in the form of a legitimate police and military, bureaucratic regulation of institutions or societal mythology/symbolization), and reproduction (ensuring adequate survival rates and economic opportunity for the formation of families, rearing of children, and socialization of adolescents and young adults).

These logistical pressures face all societies when they begin to grow in size and complexity. There is not any singular, ideal, response to these logistical pressures either: founders effects, historical contingencies, particular local cultures, histories of natural disasters, or civil wars and so on will all influence precisely how any given society responds to the logistical pressures facing them, and how effective any given response will be. However, human societies everywhere face similar coordination problems for managing population, production, distribution, regulation and reproduction (see Turner, 2010a; Turner and Maryanski, 2015; Turner and Machalek, 2018; Turner et al., 2018). Turner and his colleagues categorize societal reactions to logistical pressures (which might, again, take many idiosyncratic forms depending on the particular society in question) as follows: “Spencerian” responses, “Durkheimian” responses, “Marxian” responses, and “Weberian” responses.

A “Spencerian Type 1” response would be for individuals to create new organizations, technologies or symbolic representations that help to coordinate behavior in ways that respond to whatever logistical loads are most

Population: Pressures to integrate and support rising numbers of demographically and ideologically diverse individuals and sub-groups.

Production: Pressures to extract and refine natural resources for purposes of survival and construction of infrastructure.

Distribution: Pressures to adequately transport people and material resources across space.

Regulation: Pressures to regulate the behavior of individuals, sub-groups and institutional resources.

Reproduction: Pressures to ensure the survival of each generation, as well as the socialization of children into adulthood.

Figure 3.1 Logistical Pressures Facing Growing Societies
Source: Adapted from Turner, 2010a

pressing. This sort of response to logistical pressures leverages people's entrepreneurialism and innovativeness to come up with new solutions to old problems. However, once new organizations and/or ideologies emerge, there is no guarantee that they will be adequate to reduce logistical pressures. And even if they are, such organizations or ideologies will need to be maintained, spread, and coordinated with other existing organizations and ideologies in a society. This latter task of maintaining and regulating organized attempts at addressing logistical pressures is termed a "Spencerian Type 2" response. In a sentence, we might say that Spencerian Type 1 responses are attempts to innovate solutions to logistical pressures facing society, while Spencerian Type 2 responses are efforts to stabilize, maintenance, routinize, or spread these perceived "solutions" (some of which will be more effective than others and many of which will not be effective at all).

"Durkheimian responses" to occur when organizations compete for money or for symbolic resources related to some endeavor to reduce logistical pressures. Organizations, of course, will completely disband and dissipate if they fail to compete for enough resources successfully. But, often, instead of dissipating completely, organizations will differentiate into more numerous sub-organizations which are easier to manage, or, the organization will specialize in new niches by maximizing the resource streams to which it does have access. In cases where organizations compete successfully, they can develop monopolies and/or expand their resource base or level of production. No matter how innovative and successful a solution to a given logistical pressure might be (i.e., Spencerian responses), if the organization developing or advocating for that solution cannot adequately compete for money, employees, or political legitimacy, the solution will not be accepted or enacted.

"Marxian responses" occur when an emotionally charged subpopulation becomes "[mobilized] for conflict, sometimes led by polity but equally often by religious leaders," (Turner et al., 2018, p. 226). As logistical pressures bear down on societies and lead to rising unemployment, stagnant wages, pollution, crime/violence, disease, political infighting, and so on, social systems become vulnerable to external shocks (e.g., war with other societies) and internal shocks (e.g., mass unrest or civil war). People in a society inadequately responding to logistical loads (even if current responses are only inadequate relatively, as measured against prior, recent responses) will tend to be more deprived and could begin to attribute their fear, guilt, shame or anger to government. Often, this negative emotion in the population is harnessed and inflamed by charismatic political, religious, or celebrity authorities heading their own subversive social movement organizations (Turner et al., 2018).

Social movements to redress perceived grievances in the population are successful to the degree that they (1) verify the identities of adherents

more effectively than other domains of civic life; (2) grow and divide into integrated subgroups which helps increase internal coordination and commitment; (3) provide opportunities for gaining prestige and influence within the organization; (4) effectively catastrophize: that is, raise emotional concern about the impending dangers of whatever ill, scourge, or immorality is being fought against (Turner, 2013).

Rarely do social movements represent a totally new construal of a nation; often, existing national myths and narratives will be repurposed to advance (1)–(4) above. Historically, radical re-interpretations of religious tradition were used to galvanize beleaguered segments of populations. In recent centuries, however, secular political utopianism specifying a pure untainted past, or, alternatively, dystopianism, specifying that a country is riddled with racism and cruelty, seem to be providing the ideological fodder for social movements. In either case, catastrophizing is the key: regardless of the actual, objective, severity of a given social problem, the social movement organization must terrify the public into believing the problem is much worse than they could possibly imagine. Donations of money and support follow shortly thereafter, so long as the public can be convinced of the problem's severity.

“Weberian responses” are the most recent posited form of response to logistical pressures in this area of scholarship, explicated most recently by Seth Abrutyn. He draws from his work on entrepreneurship (e.g., Abrutyn and Van Ness 2015) to propose Weberian responses as “the process that occurs when individuals and collectives purposefully innovate technologically, normatively, symbolically, and/or organizationally for the sake of self-expression, mobility or protecting existing privilege and power,” (McCaffree and Abrutyn, 2020, p. 13).

Weberian responses to logistical pressures are a component part of Spencerian, Durkheimian, and Marxian responses because individuals (and sub-groups) are, of course, the proximate agents involved in creating new organizations and occupational specializations. To focus on Weberian responses to logistical pressures is to examine the ways some methods of innovation and entrepreneurialism (and, indeed, some methods of presenting novel ideals) are more effective than others; there is, in this sense, a “selection pressure” acting on agents to create and innovate in ways that are likely to be admired, approved of and subsequently adopted by others. It is not just the creation and maintenance of new organizations, competition among existing organizations, or social movements that describe how individuals in society respond to logistical pressures—it is also that individuals and sub-groups compete to frame their own particular solutions, their particular innovations, as better than others, and this occurs, constantly, *within* new and established formal organizations and *within* social movements.

For Turner, recall, societies are embedded entities. At the largest level is the inter-societal system composed of nations engaged in trade, enforcing agreements through treaties or involved in some other way in one another's cultural or political affairs (Turner and Machalek, 2018). Inter-societal systems themselves are, of course, composed of societies. Societies are, in turn, composed of institutions and stratification systems. Institutions are, in turn, composed of organizations and organizations are composed of demographic and ideological sub-groups which are themselves composed of individuals and their families.

This multi-level model of embedded social systems "defends the precious cargo of the human body," (Turner and Machalek, 2018, p. 253; see also Lenski, 2005). Just as the human body constitutes a survival vehicle for genes (Dawkins, 1976), groups, organizations, institutions, societies, and inter-societal systems constitute survival vehicles for bodies. These embedded social systems might be termed an "extended phenotype" (Dawkins, 1982) protecting human bodies from the vagaries of disease, violence, starvation and death. In an analogous way, hives do indeed protect bees from weather and predators and provide stores of food, so too do anthills for ants and termite hills for termites. We might recoil at any comparison of our godly selves with lowly insects, but our multi-level social systems do indeed protect our bodies and, thus, allow for our survival and reproduction in a way similar to how individual bodies protect genes.

However, unlike Darwinian selection, "sociocultural selection" for these scholars is Lamarckian, meaning that aspects of organizations or institutions that are better resourced persist, and those that are under-resourced disappear, differentiate or re-specialize. This sort of "selection" is ongoing and fluid, happening minute over minute, hour over hour, year over year. Such Lamarckian selection causes of much more rapid changes to a society compared with the slow, intergenerational, transmission of gene frequencies in Darwinian selection. Here is Turner on the difference between Darwinian biological selection and Lamarckian sociocultural selection:

Much sociobiology and evolutionary psychology implicitly tries to sustain a Darwinian view when, in fact, superorganisms [i.e., human nations and states] operate under different mechanisms than organisms [i.e., individual human bodies]. Superorganisms may have some of the same kinds of adaptive problems as organisms...but the selection dynamics involved are very different. These selection pressures do not blindly select existing variants...but, instead, force actors to create new structures and cultures because existing [organizations and institutions] cannot solve adaptive problems. Evolution thus becomes more Lamarckian...Still, it *is* selection to which human actors can respond by creating new [organizations and institutions]...that can manage these pressures; and the evolution of each institutional

domain in human societies—kinship, economy, religion, polity, law, education, medicine, sport, art etc., evolved initially under such selection pressures,”

(Turner et al., 2018 pp. 174–175)

3.1.2 Commonalities Among Sociological Theories

The origins of modern stage models of cultural evolution in sociology can be traced to the mid-twentieth century work of anthropologist Leslie White ([1959] 2007) and Ester Boserup (1965), both of whom were motivated to build on the stage models of earlier scholars like Spencer and Durkheim. A key innovation, starting with White (1943; 1949), was to deeply consider the concept of energy capture—that is, the ways in which a society’s technologies (and the norms surrounding technological use) extract energy from the surrounding ecology.

White speculated that a society’s institutional complexity was strongly influenced by the total amount of energy used (in the form of food, electricity, clean water, building materials, etc.) multiplied by the efficiency with which energy was extracted from the surrounding environment. In one of his original statements of this principle, White argues:

“This leaves us, then, three factors to be considered in any cultural situation: (1) the amount of energy per capita per unit of time harnessed and put to work within the culture, (2) the technological means with which this energy is expended, and (3) the human need-serving product that accrues from the expenditure of energy. We may express the relationship between these factors in the following simple formula: $E \times T = P$, in which E represents the amount of energy expended per capita per unit of time, T the technological means of its expenditure, and P the magnitude of the product per unit of time.”

(White, 1943, pp. 336–337)

White’s understanding of cultural evolution was innovative in another sense as well, namely, it was overtly nonlinear. Societies might increase in size and complexity, according to energy capture technology and norms, but should energy capture decrease (due to system collapse, revolt, changing climate etc.), then so too would societal complexity decrease. On this, White writes:

“The key to the future, in any event, lies in the energy situation. If we can continue to harness as much energy per capita per year in the future as we are doing now, there is little doubt but that our old social system will give way to a new one, a new era of civilization. Should, however, the amount of energy that we are able to harness

diminish materially, then culture would cease to advance or even recede. A return to a cultural level comparable to that of China during the Ming dynasty is neither inconceivable nor impossible. It all depends upon how [people harness] the forces of nature and the extent to which this is done.”

(White, 1943, p. 350)

The first “stage,” of energy capture for White involved humans using their own physical labor to extract energy from the environment in the form of hunting wild game or gathering fruits, nuts, plants and roots. Animal domestication and the widespread cultivation of livestock constituted a second “stage” of energy capture, because animals such as goats or oxen might be used for food (e.g., milk, meat) and as sources of labor (e.g., ox-driven plows). Animal domestication constituted a new “level” of energy extraction, though, again, this “level” was not uniform (humans did not adopt animal domestication en masse), and it was not linear (pastoralists occasionally abandoned animal domestication in order to forage or till small plots of land by themselves depending on climate or political circumstance, see Scott, 2017). Further stages or levels of energy capture included the uneven rise of large-scale agriculture in early states and, later, the uneven rise of coal, natural gas, and most recently nuclear energy use. White’s “stages,” of cultural evolution were not literally delineated events, but rather, mere abstractions or rough empirical approximations of how culture had changed over time, with no implication of necessity or smooth linearity.

Boserup’s (1965) influential work added further complexity to these dynamics. Between 1965 and 2008, Boserup’s work was disseminated by five different publishing houses across seventeen editions and has been translated into multiple languages (Turner and Fischer-Kowalski, 2010). Among other important insights, Boserup insisted that there was no “need” for increases in societal complexity. People were not necessarily driven to reach a new level or stage of energy capture. Rather, the anthropological and archaeological records are clear: people habituate, for long stretches of time, to a given mode of subsistence, and to certain forms of technology and rates of energy capture. Technology and energy capture are unlikely to grow in sophistication unless people within societies feel pressured to innovate in response to survival concerns (typically, rising population demand for resources) and, even then, many societies simply collapse in response to such pressures (see Diamond, 2005). The very normativity of technology use and patterns of energy extraction within a society, that is, the ways in which modes of subsistence become institutionalized and instantiated in status hierarchies, often discourages individuals in societies from seeking further innovation (i.e., people avoid developing new ideas out of concern for being stigmatized as odd,

offensive, deviant or risky). And, when technological innovation does occur, habituation often prevent the adoption or dissemination of the innovation (i.e., even if others acknowledge the innovation, they might prefer to stick with what they know and with which they are familiar).

Boserup is perhaps most well-known for her refutation of Malthus's ([1798] 1976) classic assumptions about population growth and societal collapse. Contrary to Malthus, who held that population growth rates were limited by available resources, Boserup insisted that population growth constituted a selection pressure for the further development of technology, which enabled larger populations, which necessitated further technological innovation and so on. This interpretation of population growth and technological sophistication highlighted the fallaciousness of Malthus's early concerns and opened researchers up to the possibility that population growth could continue unchecked so long as innovations in resource extraction were developed. If not, societies might collapse, and if so, societies would continue to grow. More recent work has focused on integrating the views of Malthus (that population pressure leads to population decline via, for example, migration or disease or war) and Boserup (that population pressure leads to openness to technological innovations which allow for greater population growth—see, for example, Demont et al., 2007).

The insights of White and Boserup, among others, were further explicated in the works of Patrick Nolan (2014) and Gerhard Lenski (2005). For Lenski and Nolan, and similar to White, human societies can be broadly identified according to five ideal “types” predicated on distinct forms of energy capture: hunter gatherers who foraged, horticulturalists and pastoralists who either depended on small farming plots, or a small group of domesticated animals, agriculturalists who combined animal domestication and plant domestication at scale, industrialists who captured non-living energy (fossil fuels, coal), and post-industrialists who are responding to the pollutive potential of fossil fuels by attempting to develop sustainable forms of energy capture.

Taken together, these theories have much in common: as societies grow in size, they grow in complexity, meaning that individuals and organizations tend to become dedicated to specific institutional or energy-extractive tasks that (optimally or non-optimally) help to sustain the society. Large societies have people dedicated to waste disposal, for example, or child care, whereas small foraging societies do not. This division of labor in large societies helps to sustain cooperation and information transfer among very large numbers of people. So, the question becomes: how do we understand the general structure of (non-linear, non-teleological) changes from small foraging societies, where each person, for example, monitors their own garbage or waste, and where people throughout the band will aid in child-rearing (“alloparenting,” see Hrdy, 2011) to very large

societies where entire occupational sectors are dedicated to garbage collection/disposal or childcare/early child education? This is, fundamentally, a question about the ways institutions differentiate within societies and create pockets of increased complexity harboring, potentially, new opportunities for system growth and adaptability (see Eisenstadt, 1964).

One way to think about this dynamic is in terms of feedback loops between population increases and attempted responses to rising logistical pressures (e.g., population increase creates demands on food production, and if food production meets—or exceeds—the demand, more people can be born, generating an even more severe demand on food production and so on). New strategies for meeting these logistical pressures accumulate in human cultures and are communicated across generations within a society and within trade relationships between societies, sometimes leading to qualitatively new forms of social organization and technology. As early human tribes—and especially very early states in Mesopotamia—flashed into and out of existence, experiments in social organization were taking place. Some societies were more stable and longer lasting than others, yet, the better a society met logistical pressures, the more it was charting a particular course of social and political development that researchers might at some arbitrary point decide takes on a new “form.” The “point” in time at which social organization takes on a “new form” is of course arbitrary. For example, “when” the first empire emerged matters less than the observation that agrarian kingships can be used as a helpful guide for when a new degree of power centralization in human societies emerged. Or, “when” the first use of fossil fuels for energy occurred matters less than how the widespread use of fossil fuels has facilitated the physical and cultural re-organization of human societies.

Modern evolutionary sociologists are *not* naïve stage model theorists, believing in “necessary stages” in the “linear development” of societies from small bands of hunter gatherers, to settled small-scale horticulturalists, to agrarian empires to industrial states, and so on. Observers less familiar with this area of research might confuse them for doing so because, sometimes, they assess different “forms” of societal complexity. Yet, this does not mean that different forms of societal complexity are inevitable, develop linearly, are necessarily desirable in all facets, or are somehow irreversible. To study any societal formation of a species is not to regard it as *prima facie* desirable or inevitable. Rather, an analytic distinction in “forms” or “degrees” of societal complexity is simply a practical means by which to describe and analyze how societies have changed (and not changed) over time.

Turner (2010a), for example, makes a distinction between (1) “nomadic hunting and gathering societies”; (2) “settled hunting and gathering societies”; (3) “simple horticultural societies (and pastoral variants)”; (4) “advanced horticultural societies”; (5) “simple agrarian societies”; (6)

“advanced agrarian societies”; and (7) “industrial and post-industrial societies” (Turner, 2010a, pp. 256–263). These “types” are what we might call Weberian “ideal types,” in that there is no pure “industrial” or “advanced horticultural” Platonic forms of society out there to be discovered by social scientists. Rather, we can sketch a rough course-grained approximation of what “industrial” or “advanced horticultural” societies tend have in common, and then go about using this approximation as a tool for doing our best to learn about how societies can change over time.

Consider social integration. Nomadic foragers depend on one another to help with foraging/hunting, child-rearing, and defense (from other tribes, predatory animals and natural disasters). This level of integration is relatively local (within a particular tribe or ethnic group), homophilous (predicated on sharing a core ethnic or mythological tribal identities), and takes a form that is often low in hierarchical rigidity and coercion. It is not that this “form” of integration simply mandates low hierarchy and low power differentials, quite the opposite, forager bands often work very hard to keep everyone’s ego, arrogance and arbitrary demands in check (Boehm, 1999; 2012). Rather, it is that the logistical pressures bearing down on small groups of foragers—feeding and protecting everyone, ensuring that the young and elderly are adequately looked after, ensuring adequate supplies for ritual activities—tend to be easier to respond to when individual members do *not* seek excess social influence, hoard valuable resources, refrain from working with the group or abuse others and cause conflicts.

The level and form of social integration appears to become slightly less local, less homophilous and less egalitarian in settled forager societies (such as maritime societies that rely on fishing) and in small-scale horticultural (i.e., gardening) societies, in which chiefs emerge as clear group leaders and jostle for social influence by putting on feasts, festivals and other displays of wealth and generosity. Inequality also begins rising as population growth (and density) motivates people to more closely identify with their particular ancestral lineage, distinct from the group’s collective lineage.

While this identification with a particular (albeit partly embellished and mythological) lineage helps to frame individual families as distinct from others in the community, it also provides a subtle justification for hoarding goods and social influence—people begin to claim (and, no doubt, truly believe) that they are descended from a special or uniquely influential set of ancestors. The emergence of chiefs and the tightening of kinship structures (along with everything that comes with this, such as stricter property and inheritance rights) are mechanisms by which groups of growing size and internal complexity increase social coordination at the expense of social cohesion.

And, if societies continue to grow in size and in internal complexity, and logistical loads mount, new levels (occupational, city-state, national) and forms (proliferating status hierarchies, widening power differentials) of

social coordination emerge in response. Mythology and values become very abstract and highly diffuse; only their most essential or obvious or memorable elements can be shared across hundreds of millions of people within a given society (Turner, 2010a).

One interesting and very important caveat worth noting is the relative decline in inequality and in power differentials between people living in the large agrarian empires of history (replete with slavery, famine, high infant mortality, and little or no political representation for the public) and people living in modern post-industrial nations. The material and humanitarian changes that have taken place across human history, especially since about 1700, were, in part, a consequence of rising public demand for wealth, goods and political influence. Empires throughout human history have collapsed or declined in complexity because they overstretched themselves, either in warfare/conquest, or in the number of citizens (typically, elites) they attempted to accommodate (Kennedy, 1987; Tainter, 1988). One solution to this problem, as well as to the problem of how best to coordinate society generally, was to include more and more members of the public in political decision making and in economic production.

When more of a nation's citizens are actively involved in contributing to (and drawing goods from) various available markets, the demands, needs and interests of the citizenry can be better assessed (this is an important reason why the top-down controlled economies of communist nations were so ineffective, see Collins, 1990). So, too, the more influential the citizenry is in top-level political decision-making, the better, and more responsive, political policy will be in addressing the populace's various needs. We might insist that no extant political system or economic system on the globe is adequately accessible to the public, but this is not the point. The theoretical point is that rising logistical loads put pressure on individuals and organizations in society to develop (intentionally or unintentionally) solutions which allow more people to eat, find housing, purchase goods, live long lives, and flourish. If solutions are not forthcoming or are inadequate, people consume less, purchase less, live shorter lives, and have fewer opportunities—society, in this sense, declines in complexity.

3.1.3 Entrepreneurs as Drivers of Cultural Change

I will end by briefly discussing some of the newest work in this area, using Abrutyn's work as an example (e.g., Abrutyn and Van Ness, 2015; Abrutyn, 2016; McCaffree and Abrutyn, 2020; Abrutyn, in progress; see also DiMaggio, 1988; Battilana et al., 2009). This scholarship is beginning to increase the specificity of what sociologists mean by "innovation," in the context of socio-cultural "evolution." Abrutyn, like Eisenstadt (1964; 1982) before him, begins with Weber's observation that ideas, by themselves, do not

transform social structures and technologies, people do, specifically, people who adopt, transmit and re-package some ideas over others.

While this theoretical juncture could, in another section of this book, be a segue to begin talking about memes/"memetics," Abrutyn takes this in a different (not necessarily incompatible) direction. In doing so, he focuses on "institutional entrepreneurs," and the ways in which innovations are formally integrated into institutional activities. Keep in mind that Weber, Eisenstadt, and Abrutyn are not using this term "entrepreneur" only in some technological or financial sense. They mean the term in an institutional sense, that is, in the sense that there might be, for example, religious entrepreneurs developing novel and influential interpretations of scripture, moral entrepreneurs developing compelling framings of current events that move people emotionally, or legal entrepreneurs developing new ideas and proposals regarding the regulation of various sectors of society.

There is also a space for entrepreneurship *between* institutions. To the degree that institutions within a society are autonomous from one another—i.e., health and medicine are distinct from news media, or religion is distinct from education—individuals can compete for influence as communicators between institutions (Abrutyn and Van Ness, 2015). This might involve integrating the pecuniary resources of different institutional sectors, creating organizational mergers or developing shared symbolic representations in the form of myths or mission statements. Conversely, institutions that are already merged in various ways provide opportunities for entrepreneurs to suggest that institutions ought to specialize in providing a unique set of resources. In either case, institutional entrepreneurs can increase institutional effectiveness or influence whether by brokering relationships *between* institutions or by attempting to differentiate the resources provided *within* institutions.

Abrutyn begins by arguing that these institutional entrepreneurs are "both a unit of selection and a mechanism of selection," (Abrutyn, in progress). Entrepreneurs innovate, yes, but this is not necessarily a simple matter of being creative. Entrepreneurs working within (and sometimes outside) different institutions face constant competition from rivals (looking to scoop the innovation for themselves) and potential interference from elites (who might deign to, for financial or political reasons, block, slow or stall the adoption or use of the innovation). Entrepreneurs are also under their own set of obligations—personal, familial, professional—which could divert their attention from developing or implementing their innovations. For these reasons, the innovations most likely to be adopted in a society are those that (1) tend to be the most competitively successful (as when innovators are particularly charismatic); (2) are least blocked or stalled by institutional elites; and (3) tend to come from people who are the least burdened with (or the best able to cope with) the social and familial vicissitudes of life.

But whence do innovations emerge? Abrutyn identifies at least four avenues (Abrutyn, under review). The first, “elevation,” occurs when institutional outsiders or brokers develop new solutions to some existing problem by reinterpreting or re-imagining an existing solution or, less often, by developing completely new solutions. The second, “secondary entrepreneurs,” occurs when institutional elites (perhaps themselves current or former entrepreneurs) commission, mandate or direct individuals to develop solutions to perceived problems, perhaps by re-imagining old solutions or by inventing new solutions.

The third, “exogenous shocks,” occurs when parts of institutions begin to collapse, motivating certain individuals to mobilize reparative solutions. For example, during a severe disaster (drought, famine, civil war), religious entrepreneurs might decide to frame the crisis in terms of inadequate politics and policy, thus potentially reducing the autonomy of the institution of government from that of religion. Fourth, existing formal institutional practices and technologies can be changed suddenly when a faction emerges that challenges the status quo. This innovation comes from within the institution and is typically led by people of good rapport and standing within the institution who are motivated to better capture the essence of a particular tradition, mission or value.

Ultimately, for Abrutyn, what entrepreneurs do is assemble new “cultural configurations.” These cultural configurations are amalgamations of materials, ideas, or behaviors. The cultural configurations that entrepreneurial groups “make” may reveal varying levels of novelty, relevance and usefulness. Once a particular “cultural configuration” emerges, groups of entrepreneurs may compete to secure financial and institutional support for it.

Abrutyn argues that the “fitness” of a particular configuration, in turn, is determined by how long it endures within a given institution, with better routinized and more formally bureaucratized configurations lasting longer.

Abrutyn draws this term, “cultural configurations,” from Orlando Patterson (2014) who defines them as:

“...ensembles of practical and activated constituted knowledge, focused on ongoing shared goals of collectivities of varying size: professional groups, gangs, communities, clubs, organizations, movement groups, etc.”

(Patterson, 2014, p. 6)

Abrutyn himself offers the following definition of “cultural configurations”:

“...complex *clusters* or *assemblages* of normative, symbolic, technological, and organizational patterns that do not simply add extant structure, culture, or experiences, but rather engender qualitative transformation.”

(Abrutyn, under review)

Turner uses the term “socio-cultural formations” to describe his proposed unit of analysis in cultural evolution (Turner and Machalek, 2018; Turner, 2020). But, his definition of the term is as broad as Abrutyn’s. By “socio-cultural formations” Turner means the structural and cultural elements comprising institutions, organizations and groups in society. Cultural elements include texts, technologies, values, ideologies and norms as well as institution-specific resources (e.g., knowledge or certification in educational institutions or health in medical institutions). Structural elements include formal and informal territorial boundaries dividing institutions or organizations, the segmentation and spatial formation of institutional or organizational sub-units, divisions of labor, authority, and hierarchy relationships and so on. Quite broad!

Still, if these configurations/ensembles/clusters/assemblages/formations are to be the units of selection in cultural evolution, I still wonder: *what is the unit?* Are units of selection really *all* conceivable cultural components of a society? Can we draw any more specific boundaries around these units other than to say that ensembles can be any particular configuration of any ideas, behaviors or materials lasting for any nonzero length of time? My sense is that our notion of a “unit of selection” or “unit of evolution” can be more exact, even if we specify it incorrectly initially, if for no other reason than so we can know where to focus our empirical and theoretical efforts when attempting to understand cultural “evolution.”

Cyclic Theories

Cyclic theories of societal change are common throughout history; indeed, they might have been, with stage models, the very first sociological theories.

The 14th-century CE Arab sociologist Ibn Khaldun ([1377] 2015), for example, foreshadowed later French and English institutional “founders” of sociology in arguing that societies fluctuate in their “assabiyah,” or the willingness of individuals to empathize or sympathize with others in their society whom they might not know personally. Khaldun argued that societies with greater levels of assabiyah would be better internally coordinated and mobilizable, ensuring victory in warfare and in other forms of between-society competition. Over time, this would lead to a selection process, of sorts, for societies with greater and greater levels of assabiyah.

Yet, Khaldun insisted that even in growing societies marked by sufficient levels of assabiyah, people were always at risk of losing their sense of shared purpose with others, they were always at risk of forgetting, or failing to nurture, their national identity and shared futures. When a society is under attack, or barely surviving year to year, internal coordination and camaraderie between people can occur out of necessity. But, as empires grow and people within the city walls become safer and more comfortable, they may begin to pursue their own ambitions and forget their shared struggle and fate as citizens of a common nation. If comfort breeds apathy and apathy breeds indifference; then, when true calamity strikes, there is little sense of shared purpose, mobilization is delayed, and a society can begin to crumble before anyone quite realizes where the problems lie.

Apathy is not the only problem. Among those in a country convinced of their superiority (e.g., aspiring elites across institutions, from journalism to academia to politics to entertainment), unmet expectations for personal material success can produce resentment and infighting. The richer and more comfortable a nation is, the more people expect to be revered and admired regardless of their competence or capacity. The lowliest politician, journalist, or academic, incompetent in every regard, comes to insist that they be worshipped as a leader of the nation. Political, military, and

religious corruption, elite infighting, and general public apathy erode assabiyah throughout society, rendering a nation vulnerable to being taken over by a newer, more cohesive, more humble and better organized nation. The cycle—which Khaldun ([1377] 2015) thought lasted around four generations—would then begin again as this new nation begins to enjoy the fruits of comfort and stability.

If it feels like you are hearing a bit of Durkheim, Comte, or Spencer in any of this, you are right on. Yet, for each of those theorists, history was more linear than it was for Khaldun. Comte grew up just after the devastating French Revolution, yes, but he still grew up *after*, and not during or just before. As for Durkheim and Spencer, well, both could look out on society from fairly stable, very powerful, French and British empires. Khaldun, however, lived through the tail end of a crumbling empire. His life began shortly after the sacking of his nation's capital city (the Mongol invasion of Baghdad); the outlook was bleak. He must have known that societies would continue but that his would collapse.

My suspicion is that it was Khaldun's unique vantage point—looking out from a collapsing empire—that led him to develop a relatively more cyclic theory: state formation (a period of high threat and high assabiyah), when successful, is followed by stability and rising material comfort (a period of declining threat and declining assabiyah) which is then followed by slow and steady dissolution (a period when critically low assabiyah generates infighting or indifference ultimately dissolving coordinative capacities). In the latter phases of dissolution, threat is maximal because there is little legitimate centralized authority to enforce treaties or contracts and there is a declining legitimacy of public servants (like police) who might otherwise intervene and regulate vigilante justice or blood feuds. Amidst this chaos, sub-cultures with higher levels of assabiyah will outcompete others for influence and control over territory resulting, eventually, in the formation of a new state/kingdom (if, again, the society is not conquered by an outside power).

There is much more to Khaldun than my rough approximation of his cyclic theory of state/empire formation and collapse. He also developed a stage model theory of the transition from foraging and pastoral societies, which lacked centralized leadership, to sedentary societies with centralized leadership, and he clearly anticipates Durkheim's approach to religion as a source of collective effervescence and social coordination.

But let's move on to consider those who developed (intentionally or not) Khaldun's ideas. I will focus somewhat arbitrarily on Herbert Spencer and Vilfredo Pareto. Similarities between their two approaches are abundant, and these similarities usefully foreshadow contemporary cyclical models of cultural "evolution." I put "evolution" in quotes here because, as I suggested at the end of the last chapter, I am not convinced that we are helping ourselves analytically by using this term for, literally, all cultural

change. I will try to sharpen up this clarification shortly (bear with me). But, now, we need to focus on the substance of these cyclic dynamics; language games about terminology can wait.

4.1.1 Spencer and Pareto

Herbert Spencer ([1874–1896] 1898) held that population growth motivates groups to differentiate their roles and norms regarding *regulatory*, *operative*, and *distributive* dynamics. We can think of regulatory dynamics as those norms and occupations which specify how proper interaction is expected to occur between people and groups within a society (and with those in other societies). Operative dynamics are those norms and occupations that help coordinate the extraction of food, fuel, and other essential resources from the environment. Lastly, distributive dynamics are those norms and occupations that help coordinate the sharing or distribution of materials and information within a society.

Spencer thought societies—insofar as they grow in size—would need to continuously differentiate the norms and occupations embedded in regulatory, operative and distributive functions in order to meet growing demand. This is akin to the pressure on societies to respond to “logistical loads” in Turner’s (2010a) framing. However, for Spencer, societies respond to growing demands for resources and internal coordination by cycling through “militant” (fusion) and “industrial” (fission) phases (Spencer [1874–1896] 1898). Militant and industrial phases are patterned changes to the regulatory, operative and distributive structures in a society.

Militant phases are periods when societies “metamorphize” into politically centralized, hierarchical structures where material and informational resources are extracted from private organizations (and individuals) to this politically centralized state, before being disseminated to the public. Societies in this militant cycle are, in their rigidly hierarchical and centralized fashion, better prepared for the rapid social coordination necessary to adapt to severe ecological or social threats. Militant phases are periods where peoples’ access to resources and opportunities are mediated by centralized authorities across institutions (ultimately, by political and military elites); individuals’ freedoms are restricted, and their access to resources and opportunities are constrained. In such a circumstance, people become more dependent on the nation-state, making it difficult to avoid participation in projects of war or defense if they want to survive and flourish. Although individual freedom is curtailed, the populace becomes more easily mobilized by leaders on account of their dependence on these centralized authorities.

An accessible modern example of a militant phase of society might be a society drafting young men and women into war. In this case, future opportunities and resources (including social prestige) become predicated on sacrificing one’s time and energy for the nation’s projects of war, and

industries are bent toward producing goods which aid the probability of victory. Incentives for conformity across institutions will also emerge—in the case of the US GI Bill, for example, access to education was mediated by participation in warfare.

Conversely, industrial phases are periods when societies metamorphize into politically decentralized, relatively autonomous, egalitarian structures coordinated to maximize the creative and productive potential of individuals and organizations. Resources in this industrial phase tend to flow from organizations to individuals, with relatively little intervention from centralized authorities. The length and intensity of industrial cycles are calibrated according to economic productivity—the longer rising economic productivity lasts and the more peaceful relations are within and between societies, the more decentralized the social system is capable of becoming.

However, if a society exists too long in an industrial phase, it will begin to lack the ability to mobilize in response to threats. If a society exists too long in a militant phase, it begins to lack the ability to flexibly adapt to new (as opposed to older, known) threats as well as the ability to produce economic innovations. For Spencer, societal disintegration becomes more likely in either extreme case.

The concept of sub-cycling is also important. Spencer postulated that processes of internal differentiation (e.g., emergence of new occupational specialties or new identities during periods of comfort and lower threat) or integration (e.g., merging of occupational specialties or of identities during periods of strain and higher threat) within a society tend to be localized in some areas more than others. Certain geographic areas and/or certain demographic groups within a social system will be more or less prepared, given their prior experience with the presence or absence of threats, for further social differentiation or integration along regulatory, operative and distributive lines. Thus, Spencer's cycling between militant and industrial phases is not a linear process, given that variations in sub-cycling within a society might impact how militant or industrial, overall, a society becomes. Additionally, we can expect variation between societies regarding how militant vs. industrial regulative, operative and distributive structures become.

Spencer's theorizing was very abstract, because he attempted to explain very large-scale dynamics. Nevertheless, Spencer made much headway in describing the motivating force behind societal growth which was, he thought, a cycling between militant and industrial phases responding to variations in the perception of threat to the social system. Put simply, if we were to zoom out maximally and watch a society change over hundreds of years, we would see periods of hierarchical, centralized, contraction where individuals and organizations enjoyed relatively little freedom while being maximally controlled and coordinated (a militant phase) followed by

a decentralizing relaxation where individuals and organizations enjoyed little oversight and maximal creative opportunity (an industrial phase).

On and on and on like this, until the society became stuck in a militant phase from which it could not escape (perhaps owing to insurmountable threat) or in an industrial phase it could not escape (perhaps as a result of a high degree of identity fractioning in the population). And, were we to zoom in a bit closer, we would see that some demographic groups or geographic regions in the society were cycling more rapidly into, or out of, militant and industrial phases compared to others. Societies were not monoliths, for Spencer, but rather aggregations of fractal sub-cycles. Still, to the extent that people in a society experience similar threats and have similar resource dependencies, an overall trend toward a militant or industrial phase could be discerned by analysts.

Vilfredo Pareto ([1901] 2009; [1906]2014; [1916] 1935; see also Houghton and Lopreato, 1977; Vromen, 1977) also conceptualized societies as systems of internal cyclic dynamics subject to branching, non-linear change over time. Specifically, he focused on the dynamics of economic, political, and social cycles. Let's consider each in turn.

Within the *economic cycle*, if/when economic threats abate relative to a prior period, people will tend to become relatively more interested in the consumer sector of the economy, and relatively less interested in the industrial sector. Feeling comfortable and more secure, people begin to take for granted the infrastructure underneath them. Speculative investors respond to this consumer demand by shifting their portfolios to emphasize investment in consumer products over industrial manufacturing. However, at the same time, demands on infrastructure (bridges, roads, schools, hospitals) during periods of economic prosperity still require a large labor force for maintenance. These two factors—speculative investing in faddish, mercurial consumer markets amid the expansion of infrastructure—Pareto argued, would lead eventually to instability during prosperous periods because expensive consumer markets would siphon peoples' time and money at the expense of critical infrastructural maintenance and development. Thus, precisely when populations were growing amidst rising prosperity, less attention and investment would be paid to infrastructure.

Still, Pareto's theoretical point is clear. For Pareto, a prosperous society is always at risk of rotting from the core as people attend to lifestyle goods and personal recreational or professional goals while the physical and regulatory structure of schools, roads, county hospitals and courthouses crumble. When prosperity inevitably wanes once more, or when a terrifying threat arises, this weakened infrastructure becomes its own burden, and "rentiers" interested in investing in stable commodities and industrial manufacturing rise to the top of the economy as the speculators go bankrupt in their consumer-oriented venture capital pursuits. The tension driving this cycle thus occurs as rising numbers of increasingly risky

speculative investors pour their funds into consumer products during comfortable times, while the steady flow of money required to maintain and innovate infrastructure slows or is re-invested elsewhere. When and if infrastructure begins to break down, as it eventually will, the society becomes vulnerable to threats and instability, leading investors to seek more secure (if less lucrative) investments in commodities, infrastructure and industrial manufacturing.

The *political cycle* of a society involves a contrast between what Pareto termed “lions,” who defend old traditions or develop new norms for structure and order, and “foxes,” who are more individualistic and skeptical of tradition and authority. During periods of threat and uncertainty, the lions would self-select—and be socially selected by others—into positions of authority and influence. Once they assume positions of authority, lions seek increasingly hierarchical, closed, autocratic forms of social organization. Alternatively, during periods of relative stability and comfort, foxes are preferred as interactional partners and as leaders of organizations. Upon assuming leadership positions, foxes advocate for less centralized, more open, more differentiated forms of social organization.

It seems that Pareto was suggesting that whether a person is more lion-like or fox-like (or rentier-like or speculator-like as regards the economic cycle) depends on their genetics as well as their early life experiences. During periods of instability and/or perceived threat, children will be socialized (formally or informally) to behave more like lions and less like foxes. Some of these children will also have genetic propensities for this style of thought and behavior, and some subset of these children will eventually develop the aptitude and network connections to assume positions of authority. Alternatively, during periods of greater stability or lowered threat, children will be socialized (formally or informally) to behave more like foxes and less like lions. I imagine the same would be true for rentiers and speculators, although perhaps in the context of a business or finance school: during periods of economic growth and adequate infrastructural functioning, business or finance schools would professionally socialize students to behave more like “speculators” whereas during periods of economic stagnation or decline and/or declining infrastructural functioning, students would be professionally socialized to behave more like rentiers.

Finally, the *social cycle* in Pareto’s scheme begins with an unraveling of the strong, hierarchically-enforced norms that are common during periods of threat; the slow evaporation of normative constraint, order and guidance leading to a general interpersonal uncertainty that begins to constitute its own sort of threat. Pareto argued that the less distinct and salient norms in a society become, the more behavioral variation will increase, and the more people will be expected to be tolerant of *possibly*, if not yet actually, harmful or irrational behavior. This larger variation in behavior will, of

course, lead to the emergence of new forms of deviance which, in turn, will produce ever-more confusions over what constitutes appropriate behavior. This confusion and sense of normative insufficiency will lead some people to prefer more traditional modes of comportment and more strongly enforced norms.

Here, it seems Pareto is presenting his own version of Durkheim's *anomie*: societies can begin to change so quickly that behavioral and ideological variance grows to a critical point where people no longer feel confident about what behavior or belief is expected of them or of others. Whether or not this leads to suicide, depression or despair, Pareto insisted that it would most definitely lead to non-optimal social coordination and declines in cooperation. In Michele Gelfand's more recent language, we might say that societies risk becoming so normatively loose that social coordination and cooperation suffer. This is certainly a common idea among social theorists throughout history.

However, Pareto also suggested that this lessening of normative constraint during periods of prosperity might lead to an influx of free-riders, con-artists and other charismatic sophists who would take advantage of normative looseness and poor institutional oversight to ascend economic and political hierarchies by any means necessary. Durkheim would interpret this as a rise in people motivated overwhelmingly by their own idiosyncratic hedonistic desires because norms are insufficiently binding ("egoism," Durkheim [1897] 1951). Thus, as Pareto's social cycle shifts from periods of strong, directing, norms during periods of economic instability/threat to periods of weak, vague, norms during periods of rising stability and comfort, individuals begin to suffer from social confusion and/or social parasitism in a way that, indeed, Durkheim might recognize.

Ultimately, I would say that Pareto's concern is with *open* and *closed* social orientations which are in part biologically inherited, but much more significantly, a result of socialization over the life course. Some people grow up in relatively more prosperous periods, where speculative investing has fewer consequences, over-confident and under-competent sophists attain positions of institutional prestige with relative ease, and leaders—competent or not—advocate for greater openness, creativity, and flexibility. Other people grow up during times of economic stagnation or decline, when risky investments return less, standards and rules become sharper and more consequential and leaders—competent or not—insist on clear hierarchies and strong boundaries. It is not so much that one cultural style is superior to the other, but rather that across generations, societies will tend to cycle between these periods. Children in the former will experience different events and different socialization pressures than those in the latter, leading eventually to a transition in the cycle.

Open orientations are creative, innovative, accessible, dynamic, and vulnerable. They are wonderful engines of growth and change when

relatively few threats to life or pocketbook present themselves. Closed orientations are coordinated, stable, hierarchical, and defensive. They are wonderful engines of security, protection, comfort, direction, and order when threat and uncertainty begin to mount.

Pareto's excellent insight was that generations with more open orientations produce generations with more closed orientations and vice versa, *ad infinitum*. They represent a grand metamorphosis played out over eons in each society's political and economic institutions and in daily social life. Our political institutions, economic institutions and social interactions can become, as it were, more or less closed in response to our subtle perception of the reliability and resource-ladenness of our environment. This is an individual phenomenon (as we emphasize our respective traits as lions or foxes), but it is also, and most basically, an inter-generational social phenomenon.

My basic critique of both Spencer and Pareto is that they see these cycles as quite grand, epoch-defining dynamics. For Spencer, entire societies (and sub-sets of society) cycle through periods of integration and differentiation. The same is true, although framed differently, for Pareto. What neither considers adequately is that these are not only or primarily society-wide, epoch-defining dynamics. Groups coalesce and disperse much more flexibly, much more continuously, day in and day out.

Today, you might be more fused (back to my terminology) at work on account of having to attend a string of required meetings, whereas tomorrow, on your day off, you might spend all day at the park reading under a tree by yourself. If that block of meetings is unusual for your place of work, you might stay fissioned longer to recover; if such meetings are normal, you might become closer to your colleagues and forego a day alone at the park entirely. There is, in other words, a rhythm in your fission-fusion oscillation that is calibrated according to your prior experiences and expectations. It would be awkward to use the epochal language of militant and industrial or of lions and foxes. You are just you; your sub-groups are just sub-groups. Fission-fusion oscillation is occurring much more constantly, much more subtly, much more rhythmically, than these thinkers had considered.

Yes, entire societies sometimes become more centralized, while at other times, formal regulation is reduced. Or, to Pareto's points, sometimes investors shift their investing strategies fairly monolithically in response to market fluctuations. I deny none of the points made by Pareto and Spencer. I simply hope to point out a perhaps more subtle, but much more continuously important dynamic—the day in, day out, variation in the rhythm of our fission and fusion with one another.

4.1.2 Structural-Demographic Theory

Peter Turchin (2003; 2016) has recently built on the work of Khaldun, Spencer, Pareto, and, especially, Jack Goldstone (1991; 2017) to develop his “Structural-Demographic Theory,” of cyclical change. Turchin notes that, in the agrarian empires of history, rates of population growth frequently exceeded rates of economic productivity. And the more rates of population growth exceeded rates of economic activity, the more prominent were these secondary effects: prices tended to inflate, wages began to fall, rural areas became more impoverished, urban immigration rose, and food riots, wage protests, and general civil unrest became more prevalent.

Turchin then shows that population growth in agrarian societies tended to facilitate the expansion of the military and of political bureaucracy generally. These rising real costs associated with expanded bureaucracy put pressure on governments to raise taxes, and this was generally resisted by the public. Yet, without continuously raising taxes, political and military elites struggled to maintain the infrastructure and defense necessary to ensure continued societal growth and stability. Eventually, a society’s tax base could not be exploited any further, and this would often lead to what Turchin calls a “disintegrative cycle” whereby fiscal crises eroded state legitimacy and elite-mobilized social movements began competing to expose governmental incompetence. Of course, no particular political or military leader wanted to take responsibility for their society’s fiscal crises, so instead, they rushed to point the finger at one another. Competition among elites, as a result, increasingly became a contest to see who could most flamboyantly expose the incompetence and illegitimacy of existing political and economic leadership. This elite infighting radicalized the public (who were, themselves, looking for someone to blame), leading to greater political polarization, instability and, potentially, societal collapse should a major, unforeseen, calamity strike.

This disintegrative phase involved declining population size as people grappled with societal instability—birth rates and life expectancy would begin to decline, and people would emigrate to societies that promised safer, more stable political-economies. Turchin (2008) additionally notes that, at least historically, disease epidemics hit disproportionately during these disintegrative phases on account of the increased displacement/vagrancy of the non-elite population. In a neo-Malthusian take, Turchin then suggests that, with population low(er), the cycle could start again: steadily re-building production and economic growth could better accommodate the new, smaller, size of the population. Yet, populations would continue to grow until the tax base was once again strained leading competitive, aspiring, elites to once again begin blaming and shaming one another until institutions collapsed and people began dying or emigrating.

Ultimately, then, Turchin (2012) locates the origins of this cycle in the perennial problem of population growth exceeding the (taxable) “productivity gains” of the surrounding land. The agricultural productivity of land could be insufficient for population maintenance for any number of reasons, for example, because a drought results in particularly low crop yields or, alternatively, if a sudden influx of migrants increases the burden on productivity beyond capacity. Regardless of the causes of insufficient land productivity, the effect on institutions seems fairly predictable: price inflation, declining wages, poverty, urban migration, and general social unrest. A large population also means a large number of elites, and with more elite aspirants to prestigious occupations, the competition becomes intense. Elites then chide and chastise each other and, in so doing, question the legitimacy or competence of other elites working in economic, political, legal, or religious institutions. As elites bicker among each other, they contribute to a rising distrust and political polarization among the public, a public already by this point tired of incompetent elites wasting their resources. In Turchin’s words:

“As all these trends intensify, the end result is state fiscal crisis and bankruptcy and consequent loss of military control, elite movements of regional and national rebellion, and a combination of elite mobilized and popular uprisings that manifest the breakdown of central authority.”

(Turchin, 2012, p. 3)

Turchin’s indices of social instability are drawn from his own compiled database. His database is not equipped to assess the objective degree of violence or instability (since shaky historical records must be relied on), but rather, assesses changes in how such events were described, or in the number of fatalities recorded. Social instability is defined broadly, including both prolonged civil wars and single-day peasant riots; in the former, thousands might have been recorded as dying while in the latter, perhaps just a few people were killed. In the case of some uprisings, nobody was killed, but the event was still recorded as an instance of social instability. Turchin uses this historical evidence to develop measures of the duration, intensity, and scale of instability over time.

He finds, for example, that from about 500 BCE to about 400 BCE in Rome, two successive waves of political instability can be detected (one peaking in 510 BCE, one peaking in about 430 BCE) (Turchin, 2012; 2016). Then, during 350–250 BCE, two successive waves of political instability can be identified, one around 330 BCE and another around 290 BCE. Much larger spikes of political instability can be seen around 100 BCE and then again in 40 BCE (during the early tumultuous political transition from the Roman Republic to the Roman Empire known as the

Principate era). With the exception of a spike in political instability around 70 CE, the first 150 years of the common era were relatively stable and peaceful in Rome. But, beginning around 150 CE, political instability begins to rise again, and clear waves of instability can be seen in 50-year intervals: in 200 CE, 250 CE, 300 CE, and 350 CE.

Or, in France, Turchin (2012; 2016) shows a spike in instability events in 850 CE with the collapse of the Carolingian Empire, followed by relative peace from about 900–1000 CE. However, between 1000 CE to about 1200 CE, successive waves of political instability peak in 1050, 1150, and just after 1200. With the exception of a spike in instability in 1400, the period 1300–1500 was relatively peaceful, but successive waves of instability would crest in 1560 and again in 1660. Or, consider China, where relative political stability reigned from about 50 CE–130 CE during the Eastern Han dynasty, before waves of political instability emerged and reached peaks in 150 CE and again in 200 CE. A period of relative peace followed during 250–290 CE before three spikes in political violence 50 years apart, in 300 CE, 350 CE, and 400 CE. Relative peace returns from about 420 CE until 490 CE before more 50-year spikes of political instability in 500 CE, 550 CE, and again in 600 CE.

Turchin's theory is largely descriptive, but his findings are intriguing to say the least. Although exceptions do exist, Turchin finds a common pattern regardless of the country or time period: century long periods of peace and stability disrupted by successive, roughly 40–50-year intervals of civil unrest.

What's going on here with these ~40–50-year waves? It is hard to say, but Turchin supposes that, if the most active years of peoples' public and professional lives span about 20–30 years, then recurrent 40–50-year intervals of social unrest will be experienced directly by some generations (those living during the 20–30 year leadup to peak unrest) more than others (those living during the 20–30-year period post-peak). Turchin speculates that those people growing up after peak periods of unrest (as opposed to during) will be less emotionally and physically scarred by the fallout from political instability, making them easier to radicalize and, thus, easier to mobilize for yet another round of civil unrest. Turchin thus refers to these 40–50 year cycles as “fathers-and-sons cycles” because the world-weariness of fathers (and mothers), having lived through social tumult and high rates of violence, is potentially lost on their comfortable, haughty, utopian sons (and daughters) eager to pursue violence for some greater moral good.

Turchin's attempt to formally model these dynamics involves the construction of three ideal types of individuals in an epidemiological model of social contagion: *naïve agents* who are susceptible to radical narratives about the need to destroy or re-imagine existing social institutions, *radical agents* who will tend to be frustrated elite status-seekers (of any political affiliation) and *moderate agents* who are former radicals “disenchanted” with war,

violence and institutional instability and who now believe people in society must mend their differences and seek compromise (Turchin, 2016, p. 46).

Unlike naïve agents who do not have much of a focused interest in politics, moderates actively work to *decrease* political polarization and conflict while radicals actively work to *increase* polarization and conflict. After a wave of social unrest peaks, the proportion of radicals will decline in the population (as they accept victory or defeat), and the number of moderates will grow (because they are tired of the constant, damaging violence and instability). However, over time, moderates will die off or leave public life, rendering political neophytes vulnerable to radicals who, themselves, have little personal experience with civil war and violence.

Turchin describes his model as follows:

“The cycle starts when the number of radicals is low and that of moderates high. Few naïves are radicalized because they rarely encounter a radical, and the radicalization rate is low, thanks to the presence of many moderates. For the next 25 years the number of radicals continues to stay low, and the overall society enjoys a period of internal peace and stability. However, and more ominously, during this period the number of moderates declines as moderates retire from active political life. There are few new moderates because they arise only when radicals become disenchanted with radicalism and the levels of political violence are too low to cause such disenchantment and, anyway, there are few radicals to convert to moderates. As a result, around the midpoint of the peaceful phase the [relative] number of radicals begins to increase, although initially very gradually. Meanwhile, the [relative] number of naïve individuals grows, due primarily to moderates retiring and new individuals becoming adults. Around year 25, however, naïves start turning into radicals in increasing numbers...Sociopolitical instability reaches a peak around year 40 and then starts to decline. By the end of the cycle (year 50) [the collective influence of rising numbers of moderates] results in the suppression of radicals, radicalism and instability, signaling the start of a peaceful phase (and the beginning of the next cycle),”

(Turchin, 2016, pp. 49–50)

The important parameters in Turchin’s model are: (1) the probability that any given naïve person will encounter a radical; (2) the probability that any given encounter with a radical will lead to radicalization; (3) the rate at which radicals become moderates; (4) the scale of violence required before moderates lead a backlash against radicalism; and (5) the average length of time spent in public and political life for adults in a society.

Each of these parameters can vary depending on the culture and era, and this is where the uncertainty in Turchin's model lies.

He also says, quite frankly, that the *most* difficult variable to specify in his model is naïve individuals' propensity to radicalize. Just how many radicals need to be encountered, how often and for how long, before a person becomes radicalized is a key variable, and one that is hard to specify with existing empirical data. My hunch is that the ease with which a political neophyte can be radicalized is a direct function of the degree of infighting among elites across institutions—the more journalists, academics, religious leaders, politicians, and celebrities desperately try to blame one another for the problems facing society, the easier it will be for any given member of the public to latch onto a particular narrative about those awful, no good, terrible people ruining our country. This interpretation is, indeed, consistent with Turchin's theory as we will see in a moment.

But, first, recall that Turchin premised his theory on data from large historical agrarian empires. So, does his theory apply to contemporary industrial societies? It sure seems like it might. For contemporary industrial societies, though, Turchin modifies his approach (Turchin, 2016; Turchin and Nefedov, 2009). First, he acknowledges that population growth seems to be unmoored from rising poverty in technologically advanced societies. Fertility rates are lower where women's civil rights are protected and where occupational and educational opportunities are afforded to women. And numerous innovations have emerged for increasing agricultural productivity. Genetically modified seeds for widely used crops like corn, soybeans and rice, for example, are now being used to effectively reduce the incidence of disease (i.e., rice infused with vitamin A to address child nutritional deficiencies), reduce the need to use chemical pesticides (i.e., crops genetically engineered to deter pests), and increase crop yields and farmers' profits (Klümper and Qaim, 2014). Besides, occupational specialization is now so extensive that people can draw incomes from numerous industries other than agriculture—in the richest countries today, agricultural workers make up only a small fraction of all workers. Indeed, the tax base has grown in volume *and* in scope.

Despite this increased productive capacity of industrial economies, Turchin still insists that “when the supply of labor exceeds its demand, its price should decrease (depressing living standards for the majority of the population),” (Turchin, 2016, p. 14). In modern industrial societies, labor demand is far more fluid and changeable, given the rising rate of technological innovations and ever-looming shifts in the organization of economic sectors resulting from entrepreneurial disruptions. Labor supply and demand is also, today, global, meaning that unemployment in one country might in some cases be an opportunity or motivator to find employment in other countries. This is only becoming more obvious in a post-Covid-19

telecommuting world. If anything, asymmetries between the supply of labor and demand for labor in any given sector of a country's economy have become more complex and more unpredictable as the search for opportunity begins to expand beyond national borders.

Given these dynamics, Turchin presumes that scientific and technological progress will tend to produce a monotonic (if not linear) rise in health and wellbeing. However, at the same time, *expectations* for steadily advancing health and economic wellbeing will also become greater, as will frustrations when healthiness and opportunities are not forthcoming. Rising expectations for health, comfort and opportunity can cause people to become more frustrated, angry, or fearful when improvements stall or reverse. For this reason, it might be the aspirational middle class who are most prone to revolt and rebellion in contemporary societies, because they have been experiencing the greatest relative economic improvement, and thus stand to lose the most (see Turner, 2015).

There are, then, differences between agrarian and industrial nations—the latter have a larger middle class and a more rapidly rising standard of living. Yet, there are at least three cyclic dynamics which remain relevant regardless of the society, as far as Turchin (2016) is concerned. First, an excess in the supply of labor owing, for example, to immigration, can contribute to a stagnation or decline of wages for the general population, while simultaneously increasing profits for business owners and investors. Second, a rising dissemination of credentials and college degrees bloats the market for prestigious, but competitive, jobs in health/medicine, entertainment, journalism, politics, academia, and so on. This perception of market competition leads people to take greater risks (e.g., accept greater amounts of debt) in pursuit of their elite aspirations. Credential inflation (Collins, 2002) eventually increases intra-elite conflict, resulting in declining perceptions of institutional legitimacy among the public. Third, nations both ancient and modern will perennially face unforeseen fiscal crises—sudden market downturns, pandemics, droughts, wildfires, and so on—which, depending on the degree of existing public frustration and unrest, can initiate a spiraling sequence of instability leading to civil war.

Take the contemporary US as an example. Since 1970, standards of living have risen because outsourced manufacturing has enabled the cheap importation of electronics, toys, clothes, and other consumer products. But income inequality has risen, occupational stability has declined (i.e., time across the life-course spent in one occupation) and wages have stagnated (Bluestone, 1988). Income inequality has been driven by the outsourcing of labor across several sectors (from customer service, to manufacturing to computer programming), and alongside this, financiers have been accumulating more capital from investments in property or technology (which tend to create fewer jobs) and less from investments in manufacturing (which tend to create more jobs) (Piketty, 2014). Wealth inequality has

risen as well, although to a lesser extent than income inequality; wealth inequality today remains lower than any point prior to 1910 (Piketty, 2015). In addition to rising income inequality, the proportion of the US population that are immigrants has risen as well—about 4.7% of the American population were immigrants in 1970 compared to 13.7% in 2018 (Budiman, 2020).

And, beginning around 1970 but intensifying especially after the year 2000, more and more young people began taking out student loan debt to pursue increasingly unmarketable degrees (I count myself among them). By “unmarketable” I mean degrees certifying people for jobs in sectors that are not hiring at rates commensurate with rates of degree conferral, or, for jobs that do not pay well enough for people to easily build equity in property like houses. For example, without exception, each new PhD student that comes to me is convinced they will make an easy six figure salary and slide comfortably into a tenure track position after completing a single dissertation project; when I attempt gently to tell them otherwise I am met with disbelief, then frustration, then denial that anything like “market competition” applies to them. Each time, a frustrated status-seeker is born anew. I will return to the consequences of this in a moment.

Turchin maintains that these indicators—wage stagnation, declining domestic productivity, rising income inequality, rising immigration rates, rising student debt and increasing competition for elite jobs across institutions—all passed critical thresholds during the 1970s, and are intensifying to this day. Turchin’s model suggests that these indicators portend imminent political instability and social unrest; he associates these indicators with spikes in social unrest and protest movements in America across 40–50-year intervals, in 1870, 1920, and in the late 1960s and 1970s. Given that these indicators have for the most part only intensified since 1970, Turchin (2010) predicted (and seems to have been correct about) another bout of political instability and civil unrest in the 2020s (50 years after the riots of the late 1960s and early 1970s).

All we have to do is turn on the news to see the accuracy of Turchin’s prediction. Few social scientists have been so vindicated in their predictions; the only other that comes to mind is Randall Collins’ prediction of the fall of communism. Of course, the existence of instability does not tell us much about the magnitude or ultimate severity of the instability. Still, predicting anything correctly in social science must be considered a success given the immense complexity of human beings and their societies.

Any attempt to *totally* ameliorate society of this instability is, for all intents and purposes, impossible given that growing economies will tend to expand their range of goods and services beyond what is sustainable without new forms of labor, fuel, or new production technologies. Yet, any market correction that follows from an over-abundance of demand for goods, services or college degrees *can* be mitigated in its severity. On this Turchin insists:

“We need to find ways to ameliorate the negative effects of globalization on peoples’ well-being. Economic inequality, accompanied by burgeoning public debt, can be addressed by making tax rates more progressive. And we should not expand our system of higher education beyond the ability of the economy to absorb university graduates. An excess of young people with advanced degrees has been one of the chief causes of instability in the past.”

(Turchin, 2010, p. 608)

This “excess of young people with advanced degrees” is certainly more of a problem for contemporary industrial societies than it ever was for agrarian empires, which, of course, lacked any sizeable middle class or any consistent avenues for upward mobility (outside of, perhaps, military glory). The problem of a swelling class of elites—that is, of “elite over-production”—is, however, a perennial issue. Rapidly growing agrarian empires experienced a bloating of their elite class, and the same is true today for the many elite aspirants among the working, middle and upper class. Nowadays, just about anyone can get a PhD with minimal effort (universities will bend as many rules as possible to get that tuition money, and to be able to report high numbers of graduates), but the jobs just are not there and, as a result, the prestige of these degrees is destined to decline. The result is that elite over-production causes anger, frustration and a seething desire to find “those in power” to blame.

Turchin’s concept of “elite over-production,” is interesting and worth spending some time on. He defines this concept as “an increased number of aspirants for the limited supply of elite positions,” (Turchin, 2016, p. 11). When too many elites—those occupying prestigious, non-manual positions such as doctors, lawyers, accountants, artists, politicians, professors, and so on—are produced by educational institutions in modern societies, intra-elite competition rises, leading to conflicts over status and resources. One way that elite aspirants attempt to reduce competition for desirable occupational positions is to attempt to “close ranks” and develop strict, exclusionary, standards for entry, akin to the behavior of Pareto’s “lions” (Turchin, 2016, p. 15). This occurs, for example, when popular law firms raise their standards for accepting equity partners, or when university committees expect a greater number of peer-reviewed publications among new professor hires, or when physician credentialing programs raise their fees. Yet, these attempts to increase standards will only increase the prevalence of what Turchin calls “counter-elites,” who decry the entire institutional system that they feel is excluding them. Examples are litany: consider the young PhD who cannot find a job at a university and thus decries the corruption and incompetence of the institution of higher education, or, the journalist who cannot find stable employment and so insists that journalistic integrity is dead and that free media is in decline, or, the politician who is not considered for a cabinet position and

thus concludes that the political system is corrupt and immoral. Even when these frustrations are well-justified, the reliable consequence is a crisis of institutional legitimacy among the non-elite public.

Turchin's concept of "elite over-production" is remarkably similar to what Collins (2002) calls "credential inflation." From what I can discern, Collins made Turchin's basic argument on this matter before he did. But, this is no place for academic quibbling. The point is that elite over-production contributes to societal instability because highly credentialed individuals develop enormous expectations for societal influence and reward. Then, when adulation is not forthcoming, owing to competition for positions, these frustrated status-seekers reduce their cognitive dissonance by pontificating about society's apparent corruption, brokenness and immorality. Today, indeed, much of the social media landscape appears to be a space for frustrated lawyers, doctors, academics, journalists, "influencers," entertainers, and others to vent their anger toward those in society holding them back from the prestige and influence they are convinced they deserve. If their aspirations are not met, their goals not fulfilled, it must be society's fault, and by extension, the fault of other elites in control of institutions from politics to medicine to journalism. Although perhaps cathartic for frustrated elites, the effect is to radicalize and polarize the broader public who, at least to some extent, rely on these elites (and counter-elites) for information about the structure and function of institutions.

Turchin (2010; 2016) points to several indicators of elite over-production in the US (and elsewhere). For example, the number of people per 1,000 in the population aged 25–29 enrolled in law school has more than doubled since 1960; this means more lawyers who will fail to find desirable positions, rendering some significant subset cynical about law or the legal field (potentially radicalizing non-lawyers in the population). Similarly, the number of MBA degrees (Master's of Business Administration) held in the population per 1,000 people in the US grew from 1.9 in 1970 to 7.2 in 2007. Or, consider that only 8% of women and 13% of men over 25 years of age had completed four years of college in 1969; by 2019, this had risen to 37% of women and 35% of men (US Census, 2020). Again, this means a lot of college-educated people working at undesirable jobs.

Making things worse, the cost of college tuition has risen over this period as well, contributing to swelling student loan debt. In fact, student loan debt is currently the largest form of consumer debt in the US at \$1.6 trillion owed across some 45 million borrowers (Friedman, 2020). The average amount of student loan debt—\$32,731—was just three thousand dollars less than the US *median individual annual income* of \$35,977 (US Federal Reserve, 2020). Graduate and professional degrees have become more expensive as well: the American Bar Association, for example, reports that the average law school tuition has risen 250% over the past 30 years.

Sitting in undesirable jobs, after shouldering this much debt, is a recipe for cynicism, resentment and declining institutional legitimacy.

Elite over-production can also be assessed indirectly, via instances of increasing intra-elite competition. Turchin (2016, p. 205) captures some of this intra-elite competition in politics by plotting the number of cloture motions (attempts to place a time limit on consideration of a piece of legislation) and filibusters (attempts to delay or halt the consideration of a piece of legislation) in the US Senate between 1910 and 2010. He finds a steady rise in the prevalence of clotures and filibusters beginning in 1970 and continuing to the present. Another clever indicator of intra-elite competition comes from data showing the proportion of judicial nominees confirmed for appointments in US district courts and courts of appeal. Turchin shows that, since 1970, there has been a steep decline in the percentage of judges being confirmed by Congress, suggesting rising disagreement and disputation.

4.1.3 A Note on Kondratieff Waves

So-called “Kondratieff Waves” are named after Nikolai Kondratieff [and Stolper] (1935), who analyzed commodity prices in England, France and the US and discovered 47-to-60-year cycles in pricing between 1780 and 1925. He also noted 20-to-40-year cycles in the wages paid to cotton textile workers and agricultural laborers from 1790 until 1910, as well as 25-year cycles in pig iron and lead production and 40-year cycles in coal production and consumption. In each case, Kondratieff speculated that these pricing cycles were driven by periodic over-extraction/over-production (the upswing of the cycle), followed by subsequent efforts to reduce extraction and production (the downswing of the cycle). Since commodity prices across industries were not centrally planned, this cycling would seem to represent an equilibrium-seeking dynamic whereby businesses sought to extract as much as possible while also, at the same time, adjusting to unforeseen declines in consumer demand (so as to maximize profits efficiently).

Wallerstein (2004) conceptualized Kondratieff waves in modern economies as cycles of expansion and stagnation/recession. For Wallerstein, when market demand for some commodity in rich nations (“core” countries) rises, this motivates poorer but resource-rich countries (“peripheral” countries) to increase extraction of valued raw materials and production of goods. If this extraction and production meets demand, the world economy grows. However, over time, it is possible that the extraction of resources or supply of goods exceeds demand, leading core countries to reduce investments in production/extraction in peripheral countries. When core countries pull their investments from peripheral countries, economic recessions result, and the consequent layoffs and unemployment are especially damaging given the higher baseline poverty in peripheral, relative to core, countries.

Schumpeter (1939) interpreted Kondratieff waves to be periods where entrepreneurial excitement and innovation drove certain markets to expand, which at some point in the future would cause market saturation or a lack of subsequent interest, followed by a downward trend in production and consumption. However, Schumpeter was not convinced that there was any inherent regularity to this cycle in terms of the span of time it covered. He thought an economic boom coming from new innovations in extraction or production might last any length of time depending on the commodity or product at issue. Similarly, he felt that the period of time over which innovation might wane, or over which public interest might decline, would vary according to the particular product, commodity or era. He insisted that, even if a general trajectory of (1) innovation and production, leading to (2) market stagnation, saturation, and (3) reduced demand and disinvestment was predictable, the *length of time* for any given “cycle” would vary.

Mensch (1979) then added a further set of clarifications. He argued that this wave-like behavior of over-investment/over-production leading to economically painful corrections was an ongoing process that occurred quite separately from instances of technological innovation. In fact, he felt that technological innovation was a more or less random occurrence, and thus what mattered was the probability that any given innovation would be *implemented* by a government or business. During economic boom periods, Mensch thought people would resist implementing technological innovations because the potential cost of failure would be too high, in other words, rising profits could be easily ensured by sticking with existing, “booming,” technology. However, as the product or commodity eventually enters a phase of stagnation, rising competition and decreasing public demand, the costs of adopting risky new technologies lowers, and the potential benefits for doing so grows.

Volland (1987) makes the point that Mensch’s cycles of innovation are more punctuated (because innovations are suddenly adopted which ramp up costs and production) whereas Schumpeter’s are more gradual, with innovations emerging and being smoothly adopted by companies eager to make money.

Rostow’s (1978) model of Kondratieff waves adds a further note of complexity: there are times when a country’s production of a given commodity will be lagged, owing to inadequate natural resources, production capacity or infrastructure. Production of a given commodity might also be lagged or reduced, owing to a need to respond to natural disasters or wartime conflicts. Or, perhaps more often, commodity prices soar during wartime, owing to increased military-related manufacturing and resource extraction efforts—for example, the price of copper, coal, oil, wheat, and sugar all rose throughout World War II (Ferguson, 2008). Commodity prices clearly soared also during the U.S. Civil War, World War I and the

Crimean War (Volland, 1987). As a result, the steepness of the ascending limb of a new Kondratieff wave cycle—i.e., the rapidity with which a new commodity can be created/sourced and distributed—hinges in part on a society's perceived need to respond to exogenous threats (natural disasters, disease, war) as well as on how easily existing labor and materials can be co-opted for creating/sourcing and distributing the new commodity.

Efforts to establish just how long these cycles last are numerous. Probably, this is due to a lack of definitional agreement as to just what constitutes or drives Kondratieff waves. Or, perhaps, as with all of the cycles discussed in this chapter so far, as technology changes, as patterns of social organization change and as commodities change, cycle-length might fluctuate as well. Some, like Schumpeter, deny that cycles are of any consistently determinate length. But others, like Forrester (1979), insist that the ascending limb of the cycle marked by new innovations and rising financial investments lasts roughly three decades, while market saturation and stagnation occurs over one decade, and market decline and disinvestment take place over another decade. It is amusing to read serious scholars come to such varying conclusions about the existence of such waves and their supposed length.

Consider Smil (2017; drawing on Schumpeter, 1939), who insists that Kondratieff waves last 50–60 years, and notes at least three examples. Beginning during 1787–1814, Smil points out an upswing of accelerated investment and consumer demand for coal extraction and use of stationary steam engines. This wave peaks in 1828 with investments in coal gasification and the adoption of coke over coal. He then argues that a second wave is discernible beginning between 1843 and 1869 that corresponds to the production and distribution of portable steam engines in railroads and steamships along with innovations in metallurgy. This wave crests in 1880 with peak relative investments in electric light, the telegraph and telephones, steam turbines, and internal combustion engines. A third wave follows, beginning between 1829 and 1924, driven by the widespread availability of commercial electricity and distribution of electric motors. This wave crests around 1937 with the production and distribution of gas turbines, jet engines and nuclear energy, among other things. Smil (2017, p. 411) points out that the “center points of these upswings are about 55 years apart,” and that each was sparked by the adoption of various innovations in technology and infrastructure. Is Smil suggesting that such cycles will occur stably about every 50–60 years, or just that, between 1787 and 1937, we can descriptively note such cycles? Description and theory are often blurred.

Yet others insist that near wave crests, as investors and businesses begin experiencing decreasing financial returns, important resources might become relatively more costly (Graham and Senge, 1980; see also Volland 1987). Also, as a business persists, its exposure to government regulation

grows, potentially limiting its flexibility in adopting innovations or in responding to new demands or new competitors. These contingencies—the costs of acquiring particular resources or of producing certain products, or the degree of government regulation of a particular industry or company—suggest that a consistent wave-length period across eras and industries is unlikely. So, how long any given wave will last seems uncertain, however, at least over the last several hundred years, a range of 20–60 years appears to be a safe bet given available data. We should also keep in mind the possibility that as the rate of technological innovation in society grows (owing to structural conditions facilitative of open system fission-fusion oscillation, discussed in-depth in the follow-up to this book, *The Dance of Innovation*), cycles will likely become shorter.

Although these theorists disagree on various fine points, they typically agree—as Boserup (1965) suggested—that the *integration/adoption* of novel, innovative, ideas into formal institutional practice will be more common during periods of economic recession or downturn. What is more debated, but still fairly well agreed-upon, is that the *generation/emergence* of novel, innovative ideas will also be more common during economic downturns. It seems most everyone can agree that necessity might indeed be the mother of invention.

A final caveat about innovation as regards Kondratieff waves (from Santini, 1983; Volland, 1987): if innovations in resource extraction or production are perceived to be too risky or experimental (even if they are, in fact, quite helpful or efficient), this could cause investors and consumers to avoid doing business with whatever company happens to be hawking these innovations. This was perhaps most obviously the case with the public's (and investors') hesitancy to invest in Nikola Tesla's alternating current technology (we see this today in alarmist concerns about nuclear power). However, at the same time, if the adoption of an innovation occurs too slowly, it might fail to compensate for increasing demand (or declining extractive efficiency). This is not an easy bind to find one's way out of: either investors must be extremely informed regarding new technological innovations, or make risky investments with the possibility of going bankrupt.

Overall, it seems, then, that (1) “Kondratieff waves” exist, can be documented across eras and cultures, and seem in their most general manifestation to be driven by the over-expansion of technologies or over-extraction of fuel sources and other commodities, (2) these waves are associated with commodity price fluctuations, (3) these waves are also associated with technological innovations during cycle-downswing periods, and (4) these waves are most clearly discernible with regard to technologies reliant on dominant energy sources like natural gas, oil or coal (Volland, 1987).

I should say a bit more about point (4) above. Specifically, point (4) refers to very recent forms of energy and, thus, any inferences we can make about Kondratieff waves are going to be most reliable when analyzing commodity prices in the 19th century and after. Perhaps this is due to incomplete historical data past this point, or maybe it is because the pace of economic change grew so substantially during this period that such commodity price waves suddenly became noticeable. Another, related, possibility is that fuel sources have become less renewable over time; prior to the mid-late 1700s, most economies around the world were reliant on water and wood as sources of fuel (Volland, 1987). Thus, with less renewable (or less quickly renewable) forms of energy becoming more common, cycles of investment and disinvestment might also become more obvious on account of being shorter-term, that is, more punctuated.

Kondratieff waves and other business cycles seem to be an emergent product of economic feedback loops. Consider that people need metals to produce and utilize fuels because of the high pressure and temperature of combustion processes. At the same time, however, people have also needed various fuels in order to produce metals. Producing iron or carbon steel, for example, relies on fuels capable of generating high temperatures. These high temperatures can be created directly by burning fuel alongside metal in furnaces or ovens, or more indirectly by using fuels to generate electric currents or electromagnetic fields which can then be used for heating. And, then, once metals are produced in various forms, they must be distributed across a social system to be used in various technologies or constructional and civil engineering endeavors. This distribution is itself costly in terms of fuel, because of the weight of the metals.

Feedback loops like this are why economists and historians consistently see wave-like relationships between commodity pricing, innovation and economic growth. The availability of fuels influences the sorts of metals that can be made and vice versa, which influences the sorts of technologies (and infrastructures) that can be built, which in turn influences the degree of economic growth possible. Social systems, in effect, cycle through attempts at optimizing these feedback loops.

“In summary, the history of the Western industrial world has been an evolution towards bigger and more durable metal machines and structures that use a greater quantity of more volatile fuels more efficiently. Furthermore, this trend is parallel to the process of metabolism in living organisms and explains why we can expect a correlation between natural resources, technology, and economic growth.”

(Volland, 1987, p. 129)

There are certainly other business cycles we could discuss, such as Juglar cycles or Kitchin cycles. Each of these sub-cycles describes how variation

in production or investment rates can have lagged effects on commodity pricing. But, I think we should end here, on the note that these cycles appear to be signs that investors and businesses in societies (attempt) adaptations to perceived public demands, and do so by investing or dis-investing in existing resources, technology and infrastructure. Like all of the cycles discussed above, attempted adaptations in one ecological or social context can be the catalyst for motivating another set of attempted adaptations in the next.

Cumulative Cultural Evolution

I am not so convinced, as some seem to be, that cumulative culture is a unique feature of human beings. I will focus here on the example of macaques, but this is arbitrary. There is so little research on cultural ratcheting in eusocial insects that I cannot speak to such a phenomenon despite my hunch of its existence (in some form).

Mesoudi and Thornton (2018; see also Yamamoto et al., 2013) suggest four *minimum* criteria enabling cumulative changes in culture, such as the retention of cumulative innovations in tools. These are minimum criteria in that nonhuman animals might be expected to exhibit some version of these. These criteria are:

- (1) “a change in behavior, typically due to asocial learning, followed by
- (2) the transfer via social learning of that novel or modified behavior to other individuals or groups, where
- (3) the learned behavior causes an improvement in performance, which is a proxy of genetic and/or cultural fitness, with
- (4) the previous three steps repeated in a manner that generates sequential improvement over time.”

(Mesoudi and Thornton, 2018, p. 2)

In any species where this sequence takes place, researchers should expect, or at least look closely for, cumulative changes to the behaviors, artefacts, and perhaps, beliefs of the animal over time.

Point (1) above is about how variation in a behavior (e.g., use of a tool) might arise. Certainly, individuals do behave (and believe) in subtly unique and often superficially different ways, and this subtle variation in behavior (or belief) could begin to catch on with others should they perceive it to be interesting, memorable, or useful. However, variation in belief and behavior can result from other processes, such as copying errors, where one individual attempts to adopt the belief or behavior of another

and does so imperfectly, but nevertheless in a way that becomes interesting to or useful to, and thus copied by, others.

Point (2) above should more explicitly state the role of intuitions in facilitating or constraining the transfer of information or behavior. As I discuss at length in *The Dance of Innovation*, people have intuitive and often incorrect theories about the physical, biological and social aspects of reality. These intuitive theories might be a catalyst for the spread of an innovative idea or behavior (i.e., when the innovation is consistent with intuition) or an inhibitor (i.e., when the innovation is inconsistent with intuition). Although an oversimplification, this can partly explain why some innovations like electricity took so long to discover.

Relatedly, to point (3) above, a new idea or behavior will spread insofar as it is perceived to be a beneficial improvement regardless of whether or not it *actually* is. While, in many cases, the benefits or improvements to efficiency that come from innovations might be obvious, we should not assume that actual substantively useful innovations are always perceived as such. And, in order for the innovation to spread to a massive population in the tens of thousands, hundreds of thousands and beyond, it must be adopted by nascent (or established) status hierarchies across institutions; the perceptions of people in positions of authority are particularly salient for the spread of cultural innovations in largescale societies.

Also, point (4) above should not assume improvement, or at least, should emphasize the “over time” qualifier. Any accumulation of new information, in the form of repertoire or tool design, can always be eventually forgotten or become irrelevant or harmful to efficiency. All we can really say is that the more new information is encoded into the creation or functioning of a tool, the more we might say it has “changed culturally.”

Let’s consider the example of innovations in tool use among Japanese Macaques, which has been documented for at least 30 years (Schofield et al., 2018). This particular instance of cumulative cultural change was documented on Koshima island, a small island containing both an evergreen forest in the hills, and a sandy beach on the island’s west side. Macaque monkeys—just under two feet tall and around 25 pounds each—typically spend their time in the forested area, but they also journey down to the beach, where researchers have been providing them with food since the 1950s in order to better observe their behaviors.

One food, in particular, is especially popular with these monkeys: sweet potatoes. The problem is that sand, soil, and other grit and grime from the beach clings to the sweet potatoes strewn about for the monkeys, and at first, the monkeys were observed simply using their hands to try to brush the debris off of the vegetables. After all, dirt does not taste good, it can be filled with parasites, and sand can be painful or damaging to teeth.

Then, in 1953, a 1½ year old female (named “Imo” by the researchers) was observed using a new strategy called “dip and brush,” (Schofield et al., 2018). This strategy involved dunking the potato into a freshwater stream, which ran from the forested area of the island down to the beach, and then attempting to wipe any remaining sand and debris off by hand. Imo’s apparent innovation spread to her peers, who, in turn, transmitted the innovation to their parents and to their siblings. Eventually, the “dip and brush” technique was being transmitted between adults. The transfer of this behavioral innovation, between monkeys of different ages, seems to have occurred as a result of imitation and passive observation; these macaques were not “teaching” one another about the trick of dipping and brushing in any formal sense. The strategy was useful, obviously useful, and others in proximity simply observed it and adopted it.

Then, in 1955, researchers noticed a new innovation, “immerse and roll,” (Schofield et al., 2018). Macaques using this innovation held their sweet potato underwater, mid-stream, and rolled it around so that more sand and grit could be rubbed off. This was evidently an extension of the “dip and brush” method, and more effective too, because rolling the potato underwater more effectively washed sand off compared to using one’s wet hands (or fur) after taking the vegetable out of the water. Further innovations followed. One involved using salty seawater waves as a more effective cleaning agent than the small freshwater stream (the added salt probably also increased the taste of the potato). Another innovation involved the monkeys creating their own personal washing pools by digging small ditches in the sand. In these pools, filled with the saltwater from the surrounding ocean, macaques have been observed taking a bite of their potato, rolling it around in the saltwater to clear off grime and add a bit of taste, take another bite, wash it a bit more and so on. These innovations are well-documented spanning a period from 1952 to 1983.

These Japanese monkeys were given other sorts of food by researchers, as well, such as wheat grains. As one might expect, the monkeys developed cumulative techniques for preparing this food too. Initially, the monkeys were observed picking the grains up off the beach one by one with their hands. This was time-consuming and, inevitably, grains of wet sand and other debris would stick to the wheat. However, in 1956 a variation emerged termed “wheat washing” by researchers. The same macaque mentioned above, Imo, was observed scooping up a mixture of grains and sand and tossing it into the water. Sand, being denser, sank below the surface while the wheat grains bobbed along the surface of the water. Imo would then carefully gather the remaining wheat grains floating on the surface. This behavior, being obviously useful, spread as others observed it. As with the sweet potato washing discussed above, the innovation first spread peer to peer, and then inter-generationally. Subsequent innovations inevitably followed and have been well-documented across the years 1956–1983.

Do I think that these Japanese monkeys suddenly began developing these innovations in the 1950s, or that such innovations are restricted to these monkeys living on Koshima Island? Do I think that some genius individual (such as Imo the Japanese monkey discussed above) is required to discover brilliant new innovations?

No, no, and no. I am convinced that monkeys are cumulatively innovating various foraging strategies all around the world, as are other animals. It just so happens that Koshima Island macaque behavior has been particularly well documented, but we should not conclude that there is necessarily something special about macaques or about Koshima Island. And, although Imo is clearly a smart cookie, innovations do not merely arise from smart individuals—it is also possible to misperceive or misunderstand a behavior and nevertheless stumble upon a new, better, way of doing things. Maybe Imo had some good and innovative ideas but also many terrible and worthless ideas that the researchers just failed to notice! Beyond this, I would also apply the fission-fusion framework to macaque social learning (as zoologists would) and check to see if certain populations of animals innovate at different rates on account of the particular rhythm and sub-group openness of their fission-fusion oscillations.

Japanese monkeys are not the only animal capable of cumulative innovations in tool use. Cumulative cultural development is a part of the repertoire of many animals of different species; examples abound of cumulative cultural change in chimps, whales, dolphins, birds, and, perhaps, even insects (Whitehead and Rendell, 2015; Sasaki and Biro, 2017; Vale et al., 2017; Bridges and Chittka, 2019).

For now, I intend only to suggest the possibility of cumulative cultural change among humans and other animals. Cumulative cultural change is obvious in human beings, but it is not only a human phenomenon. Unfortunately, a detailed discussion of cumulative cultural development across species is beyond the scope of this book. My paramount concern here is with cumulative culture in human beings, and at what point cumulative change becomes cultural development or cultural evolution. So, we will return to our task below.

5.1.1 Cultural Group Selection

“Cultural group selection” (Richerson and Boyd, 2005; Richerson et al., 2016) is a school of thought that is more rooted in the disciplines of anthropology, economics, and psychology, less so, sociology. There are, however, important synergistic similarities in how all these fields view culture.

Cultural group selectionists understand cultural “evolution” as a pair of complex processes. One process occurs between groups as they are variously “selected”—via between-group competition over resources or

adherents—for increased complexity, mobility and internal cohesion. Another process occurs within groups and involves demographic change (e.g., increases in population size) interacting with biases in social learning (e.g., a tendency to copy perceived high-status people) in ways that allow for the cumulative modification of ideas and behaviors across generations.

These theorists focus heavily on how learning styles (from skill-based learning to learning about empathy) and social norms differ around the world depending on local ecological conditions. We might state the theory this way: some learning strategies regarding some norms in some contexts will be more conducive to social cohesion and internal social coordination than others in other contexts, and, more cohesive societies will outlast or outcompete less cohesive societies over time, all else equal. Those societies that outlast or outcompete others will have a disproportionate impact on the nature of the norms and learning styles that end up getting “transmitted” to the next generation. When these theorists say “outcompete” or “outlast,” they do not just mean in warfare or in zero-sum resource struggles. They mean these terms in the sense of any resource that humans value, including quite benevolent resources like trade, as when societies compete to be viewed as optimal trade partners.

When they’re not carefully collecting ethnographic and experimental data on peoples from around the world (e.g., Purzycki et al., 2018), cultural group selectionists often make use of agent-based simulation models and game-theoretic simulations to support their contentions (e.g., Hales, 2010). They do so because, outside of incomplete historical or archaeological data, it is difficult go back in time and observe which learning strategies or group norms might have originally been associated with the transmission of different forms of culture in the earliest human forager groups. We can, however, program agent-based models in a way that provides insight into how information might become transferred, retained, and modified in small groups across iterations of interactions.

Cultural group selectionists have long been methodologically and theoretically cosmopolitanism. Early theorizing in this area, like that of Cavalli-Sforza and Feldman (1981; Cavalli-Sforza et al., 1982), applied population genetics models and epidemiological disease models in order to study the transmission of cultural information. Here is how they conceptualized their task:

“Cultural transmission is the process of [acquiring] behaviors, attitudes, or technologies through imprinting, conditioning, imitation, active teaching and learning, or combinations of these. A quantitative theory of the evolution of a culturally transmitted trait requires

modeling who transmits what to whom, the number of transmitters per receiver, their ages, and other relations between them... When [cultural transmission occurs] from parent to child it is termed vertical, in agreement with usage in epidemiology, and the natural discrete time unit is the generation. We use horizontal transmission to mean transmission between members of the same generation, and oblique for transmission from nonparental individuals of the parental generation to members of the filial generation,”

(Cavalli-Sforza et al., 1982, pp. 19–20)

Cavalli-Sforza and his colleagues (1982) found that some cultural traits, like religiosity, appeared capable of being transmitted with high fidelity from parents to children (they found a correlation between parent beliefs and child beliefs of $r=.71$). Other cultural traits, like political attitudes, were strongly shared among parents ($r=.79$) (Cavalli-Sforza et al., 1982). Evidence like this was marshaled to suggest that the vertical (parent-child) and horizontal (peer-to-peer) transmission of cultural information across generations (in addition, of course, to the oblique transmission of non-kin teachers instructing the next generation) could be stable enough to allow for the steady accumulation of modifications over time.

5.1.1.1 Social Learning in Cultural Group Selection

Three broad classes of social learning mechanisms are important to these theorists' approach: content-based, context-based, and credibility-based mechanisms. As you will see below, these social learning mechanisms are very compatible with some of the ways brains are said to “attract” ideas in memetic theory (discussed in the next chapter). In fact, cultural group selectionists like Peter Richerson and Robert Boyd have adopted some of memetic theory into their own work, in particular, their conceptualization of culture as recombinations of units of information transmitted between people.

In both memetics and cultural group selection (and, for that matter, evolutionary sociology and just about every other modern approach), it is hypothesized that humans learn in neurologically canalized ways. Humans are in no sense “blank slates” that learn indiscriminately. As they grow up, children do not learn in a stochastic manner, that is, by attending to information in the environment randomly or by encoding information from others without making distinctions between people. Instead, the sort of information the brain evokes and absorbs from the surrounding environment is strongly influenced by innate and acquired social and psychological filters.

Initially, Boyd and Richerson (1985) argued that people adopted and shared ideas because they encountered them often from others. One of

peoples' strongest motives, they argued, was to attempt to conform to the aggregate. People do not always adopt all of the popular beliefs and behaviors of those around them, of course, but the commonality and social acceptability of beliefs or behaviors does increase the probability that an idea will be adopted and shared. More recent work (Richerson and Boyd, 1985; Richerson and Boyd, 2005; Boyd et al., 2011; Norenzayan et al., 2016) has added further nuance. Let's now turn to these—content-, context-, and credibility-based mechanisms of social learning.

Content-based mechanisms refer to biases in the brain's information processing and memory encoding, for example, emotionally intense or socially-relevant cognitions are more likely to be attended to and subsequently stored in memory (Richerson and Boyd, 2005; Stubbersfield et al., 2015). Research also indicates a bias towards remembering and sharing counter-intuitive ideas, such as the Christian notion that god is a man with a son (Jesus), but also cannot be killed and is all-powerful (Boyer and Ramble, 2001). These content-based mechanisms encourage us to conceptualize society as a container of sorts, holding specific bits of discernible information (culture), emotion-laden, socially-relevant, or otherwise. But not all cultural group selectionists will use the term "meme," or insist that memetic transmission always contains the transmission of some discrete, stable units of information.

Context-based mechanisms refer to evolved psychological dispositions to be discriminant with regard to who one attempts to learn from, or whose ideas and behaviors one chooses to mimic. Research indicates that perceiving a person as (1) more skilled; (2) more organizationally prestigious; (3) higher in (non-organizational) social status; (4) more similar to self; and/or (5) more situationally familiar increases the probability of that person being used as a model for learning and mimicry (Henrich and Gil-White, 2001; Perreault et al., 2012). There are caveats worth noting, however. For example, while children seem to have a bias for learning from their parents and caretakers (who presumably have high status or coercive influence), if these people prove to be untrustworthy or unreliable, the bias will evoke information from some other person with high perceived status, who is more trustworthy or reliable, to learn from (see Harris, 2012). Results like this tell us that (1)–(5) above, and no doubt other learning "algorithms," can be flexibly traded off one against another, such that for example, if a more skilled person appears risky or dangerous, a slightly less skilled but more familiar person might be preferred as a learning model.

While some people might be regarded as similar to self (i.e., same gender or age), situationally familiar (wearing workout clothes or a business suit like you are), or higher in status (a manager at the company you work for, or a leader of the hiking group you belong to) and so on, these are fluid social learning cues. By this, I mean that, for example, someone's

status in one domain (which might canalize social learning), might not transfer to other domains of life. Or, demographic variables like age might determine who one learns from—more so in societies that segment youth by age (as we do in the US K-12 system, where interaction is restricted by age for much of the school day) compared with societies that provide more opportunities for people to interact across age groups during development. Context is not static; models for social learning will be prioritized differently depending on the context.

Credibility-based mechanisms refer to how sensitive people often are to cues of another person's degree of commitment to a set of beliefs, and how visible displays of such commitment might enhance the tendency to adopt said beliefs. These are called "credibility-enhancing displays" (e.g., Henrich, 2009). Indicators of a person's level of ideological or behavioral commitment can sway others to infer the legitimacy and importance of the cultural displays (verbal and nonverbal) they see given by that person. The more "costly," a display appears to be in terms of time, money, or effort, the more credible it appears and the more deeply held and valuable the belief can seem to outsiders, thus raising the probability that the belief will be adopted.

So, if someone is seen donating their hard-earned cash, or their Sunday afternoon, or their evening each week (and so on) to a particular belief or organization, people often treat such dedication as *prima facie* evidence of the value, and thus importance as a model for their social learning, of the belief or organization. So long as people do not already harbor some negative attitude or experience related to the belief or organization, demonstrations by others of time or effort or money related to a particular idea or group can provide an indicator of the importance of learning from that group or of learning more about that idea.

Ideas thus spread on account of how easily remembered they are, how high-status or similar to self the idea-holder is and/or how "authentically" (in terms of ostensible levels of commitment) the idea is presented to others. Some ideas are, thus, more likely to be transmitted across people and across generations, and this cumulative social learning is considered by these scholars to be a second form of inheritance (cultural inheritance) that influences human behavior alongside the inheritance of genes (Norenzayan, 2006; Henrich, 2017).

Some researchers in this area specify further social learning biases found outside of human beings in other mammals, birds and even fish (e.g., Laland, 2004; Miu et al., 2020). These biases include tendencies to (adding to the five already listed above): (6) copy others' belief/behavior when individually uncertain or anxious; (7) copy others' belief/behavior when asocial learning (i.e., individual experimentation, trial and error) seems unsuccessful or dangerous; (8) copy others if one's own past belief or behavior is suspected of causing harm or being ineffectual; (9) copy a belief/behavior once it becomes prevalent among the majority (i.e., 51% of

a population) or among a high-status plurality of a population; and (10) exert a level of effort in copying the belief/behavior of others that is commensurate to the apparent, perceived, payoff of the belief/behavior.

(1)–(10) above, summarized in Figure 5.1, are important for our purposes here not only because I intend to create a theory compatible with existing work. Also, (1)–(10) are precisely the learning mechanisms that become refracted in so many different ways when groups fission-fusion oscillate, particularly in the context of porous, open group boundaries. Who “counts” as skilled, what idea “counts” as a group majority idea, which type of person is similar to self in which way and so on will all become more flexible and fluid the more people enter and exit voluntary cooperative, recreational or even temporary associations.

The oscillation of fissioned and fused states, and the combining and recombining that results, ensures that the filters in our mind which canalize social information are not inhibited by exposure to only a few “types” of people in a few “types” of settings. This is an important sense in which open system fission-fusion oscillation (wherein individuals can easily enter and exit group associations, discussed in-depth in *The Dance of Innovation*) can adjust or enhance group decision making. In an open system of fission-fusion oscillation, fairly stable learning biases can be expressed in more various ways across more various settings in pursuit of more varying goals.

Make a greater effort to emulate others:

(Amongst All Animals Including Humans)

- When uncertain or anxious
- When your own efforts appear or have appeared unsuccessful or dangerous
- When the behavior of the majority of others becomes uniform
- Only as long as some payoff or benefit appears to result

(Amongst Humans and Some Other Animals)

- When they appear to have valuable skills
 - When they appear to hold prestige in a group one wants to become a member of
 - When they appear more similar to self (and self-identities)
 - When they are more situationally familiar
-

Figure 5.1 Social Learning Decision Criteria Across Species

5.1.1.2 Cooperation

Cultural group selectionists correctly point out that cultural “evolution” over the last 12,000 or so years provides a unique puzzle for the social sciences. In small nomadic foraging bands, mechanisms such as kin selection, reciprocal altruism, reputational maintenance, and social supervision appear sufficient for maintaining cooperation and social coordination in the

service of hunting, childcare and occasional warfare. However, anthropological evidence on contemporary foragers indicates that these people live in residential groupings of only about 14–60 individuals (Kelly, 2013). How then, was it possible to scale population into the tens of thousands, then hundreds of thousands, then millions and beyond? In societies of this scale, as I have pointed out in earlier chapters, individuals who are acquaintances, if not total strangers, must be relied upon regularly as trade partners and community members in a growing cosmopolitan culture.

Some of these theorists point to the cultural “evolution” of monotheism (e.g., Norenzayan, 2013; Norenzayan et al., 2016) as an example of the “evolution” of cooperative norms. Broadly, this work suggests that religious ritual (Sosis and Ruffle, 2003; Soler, 2012; Whitehouse et al., 2014), subjective perceptions that god is always watching us (Piazza et al., 2011; Atkinson and Bourrat, 2011), subjective fears of supernatural punishment (Johnson, 2011; Johnson, 2015), and third-party punishment, where observers step in to punish norm-violating individuals (Jordan et al., 2016) might substantially increase the social cohesion and coordination necessary for societies to scale up in size. These theorists contend that monotheism enabled societies to scale up in size by outsourcing reputational concerns, supervision and social control to a massive, all-powerful, invisible, omnipresent deity. Benefits to social cohesion engendered by these monotheistic beliefs, they argue, caused a recursive socio-cultural selection process that further spread and further solidified the notion of a big, watchful God.

Norenzayan and colleagues (2016) therefore suggest that the notion of a big, powerful mega-god was attractive to human beings already evolved to (over)contemplate minds, and they argue that the more people considered the notion of a watchful mega-god, the more pro-social they would have acted. And the more pro-social people became toward strangers in their society, the easier it was, in turn, to coordinate behavior with larger numbers of people, thus, over time, scaling up populations in human societies.

Critically, in a point originally made by Spencer (1898), the more socially cohesive groups become, the more successful they’re likely to be in warfare, resource extraction or anything else and this success in competition could have, itself, facilitated the spread of norms engendering within-group cooperation (Richerson et al., 2016). No monotheism necessary, or, maybe, monotheism was an epiphenomenon, not a cause, of societal growth (see McCaffree and Abrutyn, 2020).

It is also quite important to insist on the point that in educated, industrial, rich democracies, secular “supervisors” such as ubiquitous security cameras, police and the criminal justice system appear plenty capable of facilitating cooperation (or, at least, stemming conflict) in ways that supernatural religion might have in the past (Norenzayan and Gervais, 2015; Yilmaz and

Bahcekapili, 2016). Secular third-party punishers (police and the legal system) can also serve to enforce the same moral norms that the gods of old did, without the supernatural wrath (Norenzayan and Gervais, 2015).

5.1.1.3 Innovation

According to most cultural group selectionists (and, before them, Herbert Spencer, 1897; see also Turner, 1985), norms facilitating in-group cooperation and coordination will benefit societies engaged in warfare, trade, and/or natural resource extraction, production and distribution. In warfare, more organized and cohesive societies will mobilize more quickly and attack in more coordinated fashion. In trade, more organized and cohesive societies will extract and distribute resources more efficiently and respond to debts more conscientiously. So, the logic is that, over time, societies with norms more conducive to internal coordination and cooperation will persist longer than societies with norms less conducive to these things. Those societies that persist longer will have more opportunities to spread their norms to others, perhaps because those in less successful societies immigrate to more successful societies, perhaps because a conquering society's norms are imposed, or perhaps because people in less successful societies preferentially mimic the norms of more successful societies.

Societies that are larger and denser will be less likely to lose valuable information pertaining to helpful technologies or forms of infrastructure (Henrich, 2004). This is because the larger and denser the society, the more opportunities there will be for transmission of a particular unit, or linked units, of cultural information (or “memes”). Although copying errors will occur, a regression to the mean effect will ensure some degree of copying fidelity occurs intergenerationally, most of the time, when information meets the input criteria for our various learning biases. And, besides, moderate rates of copying errors would be a source of variation in cultural information (as when a norm is learned incorrectly but nevertheless produces benefits to cohesion), which could then be selectively learned and transmitted by some groups over others, potentially setting off a new process of group selection for internal cohesion and coordination¹.

Larger, denser, societies are assumed to be less likely to lose *any* information perceived to be valuable, whether it is *actually* valuable or not. Particularly complex information (rational or not, helpful or not) will, then, be more likely to develop and persist in large, densely populated environments with a variety of “experts” and eager learners (Caldwell et al., 2016). In support of this, experimental research shows that the combination of effortful learning along with a general motivation to mimic those perceived to be prestigious (to say nothing of our other learning biases), can produce a ratcheting effect of cumulative cultural

transmission, “even if transmission is generally inaccurate” (Derex et al., 2013, p. 389).

These theorists also point out that the development of writing, printing and now electronic data storage systems has lessened our reliance on individual memory as a means of retaining complex information (e.g., Derex et al., 2013; Henrich, 2017). Among ancestral and human foragers, innovations in norms or technology would have been transmitted via oral or behavioral tradition and ritual, and both of these would have drawn heavily on the episodic and semantic memories of group members, perhaps especially elders. But, again, large, dense populations reduced the cognitive burden on any one person to recall units of cultural information exactly, and with the invention of formal writing, printing and electronic storage systems, the burden is lessened further. This growing capacity to retain cultural information in these external (to any one human brain) storage systems might also aid in the generation of novelty and innovation, since less of the brain’s processing energy must go to keeping all aspects of complex cultural information in memory.

However, one implication (supported with evidence, see Henrich, 2004) is that if/when population size and/or density declines markedly, or if/when communication (storage) technology breaks down or is destroyed, the capacity of a society to retain the information necessary to perform complex skills or develop complex cultural artifacts will suffer and, so too, might the potential for innovation and adaptability.

Henrich has also tried to show that the rate at which people adopt new innovations is consistent with basic social learning mechanisms. Drawing on work by Everett Rogers (1962), Henrich (2001) insists that at least 3,000 studies now support the hypothesis that peoples’ tendency to adopt an innovation follows an “S” curve. This S-shape in the data denotes a prolonged period of time when only a few people adopt an innovation, followed by an inflection point when about 10%–20% of the population adopts the innovation, which continues to rise until about 90% of the population adopts the innovation, at which point rates of adoption begin tapering off.

Consider a specific example of this “S” shaped curve that seems to represent a common pattern of the diffusion of innovations. Henrich (2001; drawing from Ryan and Gross, 1943) tracks the diffusion of a new hybrid corn seed in two different farming communities in Iowa between 1926 and 1941. He finds a steadily increasing rate of early adopters between 1927 and 1933. Then, between 1934 and 1939, the proportion adopting the new seed jumped from just under 20% to around 90%. By 1940 the increase had nudged up to over 95%, but the rate of adoption had begun leveling off significantly.

Not all periods of innovation adoption follow an “S” shape. Some follow an “r” shape, where individuals tend to rapidly, and with little to no lag, adopt a new behavior or technology. Henrich suggests that social learning biases, in particular a desire to conform to others, can explain the “S” shape that emerges when the rate of adoption often increases so rapidly from about 10%–20% adoption to 50% and beyond. But, what of the “r” shape? Henrich (2001) suspects that innovations adopted rapidly are innovations that are memorable, useful, and fairly easy for individuals to figure out—like using a big stick to knock coconuts down. Innovations like these, however, might become more rare because the problems of resource extraction, processing and distribution facing growing populations become more complex and difficult to solve.

Because r-curves are relatively rare in research on innovation diffusion, Henrich concludes that the adoption of innovations is not random, or dependent on individual learning but, rather, for the most part, dependent on social learning biases, like conformity biases.

Rogers’ (1962) existing theory and subsequent research supports the claim that early adopters of innovations tend to “have larger social networks, higher status, more money, more cosmopolitan contacts, and more exposure to mass media outlets,” (Henrich, 2001, p. 1009). People with these characteristics are hypothesized to have further reaching social networks (i.e., more diverse, if weak, social ties or more media consumption) and to be more confident as well as financially able to take risks (i.e., high status, higher income). People like this adopt innovations early, and then, Henrich contends, conformity biases (perhaps in response to the “costly signaling” of early adopters of an innovation or perhaps owing to early adopters’ existing prestige) drive adoption rates among the wider public.

Henrich also points out that this research on the diffusion of innovation has been done on a systematically biased sample—only innovations that diffused widely were included. This means that those who adopted innovations that failed to diffuse much at all, or diffused only moderately, are under-studied and under-represented in our theories. It might well be, as Henrich (2001) suggests, that all people adopt innovations at similar rates (albeit with expected variation around personality traits like “openness to experience”), but only those innovations that are *also* adopted by people with far-reaching networks who are confident and able to take risks end up spreading widely. This bit of theory links nicely with Abrutyn’s and Turner’s framing of the roles played institutional entrepreneurs in cultural “evolution.”

5.1.2 Henrich’s Gene-Culture Coevolution

Henrich (2017) offers numerous examples of the ways in which genes and culture have likely reciprocally interacted over the course of hominin and

human evolution. The discovery of fire and the development of early stone tools, for example, allowed for the consumption of larger amounts of meat. The creation of shelters and huts, and the tracking of animal movements would have kept people safe and well fed. Carving spears from wood, or hand-axes from stone, would have also contributed to hunts, and to defense. These were all cultural innovations, according to Henrich, that would have contributed to the selective survival of some early hominin and human groups over others.

As a result, over time, unique genetic adaptations emerged such as a larger brain (from the consumption of fat and protein in meat), “springy” arches in the feet and long legs (an adaptation to “endurance hunting” practices), short colons (an adaptation to large amounts of consumed meat), relatively thin bone and weak muscles (an adaptation to reliance on tools like spears or rock slingers instead of physical strength) and so on. These genetic adaptations, in turn, would have facilitated the particular cultural practices associated with shaping them, in a feedback loop.

Of these genetic adaptations, the growth of brain tissue is most central for cultural group selectionists. They regard the brain, after all, as the central device responsible for the ability to socially learn from others; it is the biological machinery that allows humans to “acquire, organize and transmit culture,” (Henrich, 2017, p. 284). For these theorists, genes and cultural practice are intertwined channels of “dual inheritance.” We inherit our genes from our parents, and we inherit our normative environment from both our parents and our wider communities—these “channels” of inheritance are inextricably linked.

Perhaps the paradigmatic, if idiosyncratic, example of gene-culture coevolution is lactose tolerance (Holden and Mace, 1997). Some human populations took up and intensified the practice of pastoralism and dairying, leading to the consumption of high volumes of non-human animal milk. This amounted to a cultural innovation in resource extraction from the biotic environment—dairy milk is high in fat, sugar, protein, calcium, and vitamin D and is therefore a significant source of nutrition. Most human beings become lactose intolerant in late childhood or early adulthood. However, the descendants of populations that adopted dairying practices around 10,000 years ago developed lactose tolerance into adulthood, plausibly because those who were able to continue consuming animal milk into adulthood were healthier and thus more fecund than those who did not.

Today, owing to geographic variation in the adoption of dairying practices, over 90% of people in some northern and central European populations (e.g., Scandinavia and Holland) are lactose tolerant as adults, compared to only about half of people in Southern Europe and the Middle East and only about 1% of people living in parts of Asia and non-pastoralist Africa (Deng et al., 2015). There is even more to this story of culture’s impact on genetic

propensity (and vice versa). As Tim Lewens (2015) points out, the market availability of lactase supplements and probiotic yogurt in lactose intolerant populations can markedly improve digestion of lactose (Almeida et al., 2012). As well, exposure to acute and chronic stressors can render someone with a genetic propensity for lactose tolerance to become lactose intolerant (Swallow, 2003).

In sum, certain stably transmitted forms of culture (e.g., pastoralism) are capable of acting on and changing the human genome, at least around the edges. Also, newer or more transient cultural practices can interact with existing genetic propensities in ways that change their direction or mode of expression.

Let me briefly summarize two points that Henrich (2010) stakes out that, I suspect, many cultural group selectionists share. First, Henrich disputes Boserup's (1965) claim that threats to survival drive innovation. It is not that threats do not generate ideas about how to change one's lifestyle optimally, certainly this is a real dynamic. But Henrich's point is that innovation is not always or (even usually) a response to scarcity or threat; rather, innovation also often arises out of the inevitably low-moderate copying fidelity of social learning in addition to the tendency for people to interact with increasingly diverse others as ancient city size and density grew.

Second, Henrich (2010, p. 107) suggests that, often, innovations in cultural practices are "minor additions" that are typically not radically new but represent a subtle re-combination of existing ideas or behaviors. Henrich insists on avoiding conceptualizing innovation as an intended process, that is, as typically driven by geniuses with some great vision. Sometimes, certainly, this occurs. But much more often than it seems, innovation results from the accumulation of modest modifications, or, from "lucky errors or chance interactions," (Henrich, 2010, p. 107).

5.1.3 Heyes' Gene-Culture Coevolution

I must also mention Cecilia Heyes' (2018) work. Heyes is critical of evolutionary psychology (Barkow et al., 1992; Buss, 2015), which is a school of thought predicated on the theory that human brains developed important adaptations in the Pleistocene (and prior) that now strongly influence human social cognition in modern environments. In contrast to evolutionary psychology's emphasis on "evoked culture," (i.e., that genetically evolved cognitive adaptations are causally implicated in the development of culture), Heyes, like the cultural group selectionists mentioned above, turns her attention to "transmitted culture" (i.e., the role of social learning in modulating and directing the expression of evolved cognitive adaptations).

It is not that evolutionary psychologists ignore cultural learning, they do not, it is rather that Heyes (and other cultural group selectionists) feel that social learning/socialization has not been emphasized enough. For Heyes, as for every cultural group selectionist, the brain is filled with neurological sub-systems allowing for a unique degree of social learning in humans—this includes supposedly zoologically unique capacities for social tolerance, social motivation, associative learning, memory formation, abstraction, and impulse control/executive function. These capacities, for Heyes, allow for a unique degree of directed social learning in humans relative to other animals (she calls this “explicit metacognition”), and the consequence is that teachers and high-status models in human societies essentially canalize the plasticity and wiring of the brains of others.

Her key contribution is to really explore the implications of this: sometimes, culturally-directed neural wiring/re-wiring might produce new human capacities perhaps within a single lifetime. She explores this with the concept of “cognitive gadgets.” Heyes (2018, p. 263) defines cognitive gadgets as learned “contrivances,” that is, remodelings/repurposings of “phylogenetically ancient cognitive mechanisms.”

Let’s consider her most prominent example: literacy. Heyes notes that most all human beings are born with relevant capacities for visual acuity, self-control and pattern recognition which, by themselves, will never develop into literacy. Indeed, for most of human history, people were completely illiterate and used very simple symbol systems to communicate with each other. However, beginning with the invention of the printing press in China (later brought to Europe by Jesuits, and modified for commercial use by Johannes Gutenberg), humans began institutionalizing informal, then formal, practices to encourage people in general (not only elites) to learn to read. Today, over 90% of the world is literate, and this number is rising virtually everywhere.

Heyes argues that humans’ evolutionary history has conferred the brain with a “toolkit,” (visual acuity, symbolic reasoning, pattern recognition, etc.) that can be leveraged by new patterns of social learning (in this case, literacy training or primary school) to produce new “cognitive gadgets,” like literacy, which selectively activates and thus restructures specific regions of the brain. For example, brain imaging research shows that, compared with illiterate people, literate people have stronger blood flow to the occipitotemporal cortex when viewing written sentences. This part of the brain dubbed the “visual word form area” is named for its reliable activity when literate people view written sentences—learning to read re-wires the neural networks of the cortex (Dehaene et al., 2010).

These changes in the brains of literate people were found even when individuals became literate in adulthood, suggesting a substantial degree of neural plasticity in the development and refinement of new, culturally-derived “cognitive gadgets.” What’s more, these amalgamations of culture

and neurology, in turn, can be used to acquire new abilities beyond what our genes, alone, would allow. Once someone can read, they can learn about phenomena well beyond the reaches of their individual experience, whether this means reading a marine biologist's account of animals living 4,000 feet underwater or a British schoolchild reading about the Rwandan genocide that predated their birth.

The profundity of this has subtle elements as well. Heyes writes:

“If one did not know that reading is culturally inherited, it would be easy to mistake the reliable responding and precise localization of the visual word form area for signs that the capacity to read depends on cognitive instinct or an ‘innate module.’”

(Heyes, 2018, p. 20)

Her point is that social learning can remodel the functioning of existing cognitive mechanisms and structures in subtle ways. If and when global literacy rates reach virtually 100% (fingers crossed), a Martian looking at the brains of adults of our species could easily conclude that it is developmentally “natural” for the brain to see written words. It would not be obvious that human children are born with just some of the cognitive tools necessary for literacy, and that habitual, reliable, concerted exposure to literacy training at a young age functionally re-wired the very neural circuitry the Martian is so convinced is genetically innate. For Heyes (2018, p. 20), “...learning to read takes old parts and remodels them into a new system,” all within a single individual's lifespan, as compared to the often glacial pace of genetic evolution at the species level. Should there be some fitness advantage to knowing how to read, we would expect the human brain to evolve more intrinsic circuits for literacy, specifically. But this sort of darwinian genetic selection is not necessary for culture to directly shape genetic expression.

Heyes' prime example of a cultural gadget is literacy but it is not her only example. She offers language, itself, as a straight-forward example of a cognitive gadget. Humans have genetically-determined propensities for sequence learning, various adaptations of the throat, lips and tongue enabling articulated speech and other adaptations which might be considered part of the “toolkit” for language. Yet, without social learning of specific morphemes, syntax and semantics, people would not have the “ability” for language.

Controversially, Heyes even suggests that the capacity to imitate with high fidelity (known as *over-imitation*, see Clay and Tennie, 2018) is not genetically determined in human beings, but is rather a learned cultural gadget. She points to different lines of evidence to make this case. For example, mirror neurons are implicated in imitation, and mirror neurons are, in fact, motor neurons which have been “trained” on certain actions in others such that they only fire in the brain when

these actions are observed. The firing of these trained motor neurons help us understand what it would feel like, physically, to perform the action observed.

Mirror neurons are often over-implicated in studies of empathy and culture, as some holy grail of social learning (Hickok, 2014). This is not Heyes' point, though. Her point is merely that the genetic endowment of motor neurons is not, in itself, sufficient for producing high levels of imitation in humans. Some, perhaps minimal, degree of implicit social learning is required for motor neurons to be calibrated into mirror neurons in a way that is adaptive to the surrounding social environment. Perhaps not all mothers equally seek to mimic their baby, and for their baby to mimic them. If so, this variation would be detectable in the differential development of the cultural gadget of social imitation in humans. To the extent that humans' over-imitation is predicated on a greater distribution and specialization of motor/mirror neuron functioning in the brain, the social-cultural calibration of these neurons might confer a greater willingness or capacity to imitate.

Heyes contends that because the instructions required for the development of cognitive gadgets are transmitted across generations, and because social group membership strongly influences which cognitive gadgets a person develops, intergroup competition likely drives the cultural evolution of cognitive gadgets. Groups and societies with some cognitive gadgets will outlast others, spread further than others, or find themselves luckier in warfare. For Heyes, insofar as cognitive gadgets:

“...modulate the fitness of their bearers via their effects on living conditions including food, shelter and defense against predators... [those in] better living conditions are likely to have more children that survive and reproduce, and groups with better living conditions are more likely to persist through time and to bud, not only because their members are more likely to survive and reproduce, but also because these groups are more likely to attract net immigration... Groups with better living conditions are also more likely to have their practices emulated by other groups, including child-rearing and ritual practices that foster the development of particular [cognitive gadgets].”

(Heyes, 2018, p. 201)

Nature and nurture become analytically blurred in Heyes' work, as in the work of other gene-culture co-evolutionists. Yet, there are differences between, for example, the lactose tolerance example above and the cognitive gadgets Heyes posits. Obviously, lactose tolerance pertains to a particular digestive capacity, whereas the cognitive gadget concept pertains to ostensibly infinite cognitive capacities. Another difference, however, is more

important. In the example of lactose tolerance, cultural practices over time changed the gene frequencies of a particular population of people to render them better able to digest milk past childhood. By contrast, Heyes' cultural gadgets do not necessarily represent a change in a population's gene frequency; rather, existing pan-human genetic propensities are molded, via social learning, into new capabilities. In either case, we have gene-culture coevolution, yet, in the former case of lactose, social learning practices are changing genetic structure while in the latter case, social learning practices are "remodeling" or "repurposing" existing cognitive propensities.

5.1.4 Is the Assumption of Hyper Conformity Justified?

When cultural group selectionists use phrases like "conformity bias" they mean something a bit more than just a tendency towards social learning along with a preference to model the belief/behavior of people perceived to be high status. As Lewens (2015) points out, cultural group selectionists seem to be implying something more like hyper-conformity, over-imitation or an exaggerated sociality. This exaggerated sociality is, indeed, an important component of the "tribal social instincts hypothesis," (Richerson and Boyd, 2005). This hypothesis states that:

"[Humans evolved in] cooperative, symbolically marked groups. Such environments favored the evolution of a suite of new social instincts suited to life in such groups, including a psychology which 'expects' life to be structured by moral norms and is designed to learn and internalize such norms; new emotions, such as shame and guilt, which increase the chance the norms are followed; and a psychology which 'expects' the social world to be divided into symbolically marked groups...Cooperation and group identification in inter-group conflict set up an arms race that drove social evolution to ever greater extremes of in-group cooperation."

(Richerson and Boyd, 2005, p. 214)

Or, consider the following passage which predates the one above and, presumably, provides evidence for it. The following passage is drawn from a highly cited paper wherein over 150 computer simulations were analyzed to show the apparent broad applicability of conformity for social learning. Consider the degree of conformity assumed of humans:

"Humans live in cultural groups in which group members tend to believe similar things about the world and behave in similar ways. Individuals in neighboring groups tend to believe different things and behave in different ways, even though people from different groups may interact and even intermarry. Conformist transmission

generates a population-level process that creates and maintains group boundaries and cultural differences through time... If cultural transmission is unbiased, then, barring the action of other forces, transmission will leave the frequency of the traits unchanged from one generation to the next. For example, if 60% of a population is performing a certain behavior, barring other forces, 60% of the population in the next generation also will perform that behavior. In contrast, conformist transmission would increase the frequency of the trait from 60% in one generation to, say, 65% in the next generation. All other factors being equal, the frequency of the most prevalent trait will continually increase from one generation to the next.”

(Henrich and Boyd, 1998, pp. 219, 230–231)

Humans are assumed to not only be conformists, but to be motivated to *increase* the fidelity of their conformity over time—hyper conformity. Moreover, these theorists sometimes seem to treat groups and their norms as fairly cleanly distinct from one another, as though groups of people were reliably homogenous (remember, people in a group might all report similar beliefs, but private disagreement or uncertainty is not always verbalized and as a result, does not always adequately influence the average attitude expressed by the group).

Cultural group selectionists also insist that the central driver of the “evolution” of culture is “group selection” through competition—some groups outperform others militarily or economically or socially and this performance is held to be largely attributable to the successful group’s internal social cohesion and coordination. The implication is that people are highly normatively integrated into their societies such that some significant degree of variation in norms and values is maintained between groups over time. In other words, *normative differences between groups* must be fairly stable in order for some specific units of culture to be “selected” differentially during inter-group “competitions.” And how are such between-group differences maintained? Well, hyper conformity.

Any theory of human beings that suggests that humans might be more independent, or become more independent, poses largely unconsidered challenges to this theory of cultural group selection. Among other inarguable observations, “norms” are often cross-pollinated blends of ideas from various societies and people vary, sometimes widely, in their motivation to conform to the norms of any one setting. It is very possible that cultural group selectionists are positing an over-socialized version of humanity. The empirical messiness of wide variation in actual conformity (vs. intended conformity), between-group migration, and the societal cross-pollination of norms can be cleaned up by programming computer simulations where individuals have only two choices (conform, do not

conform), but doing so runs the risk of artificially over-estimating the propensity for conformity in people (Lewens, 2015).

Nobody doubts that humans learn socially and tend to conform (at least superficially) to common norms. The question is *how* conformist people are, and what sorts of cultural variation exists around this trait globally. Models of cultural group selection cannot simply specify high levels of conformity and justify this with the archaeological record showing humans evolved in small interdependent groups. Humans could have evolved in small interdependent groups *despite* a very individualistic propensity (Mar-yanski and Turner, 1992).

Allow me the space for just a few more points regarding this assumption of hyper conformity.

Though often just waived away as something only non-human animals do, people do, in fact, draw their own inferences and learn from their own individual trial-and-error “experimentation.” Certainly, cultural evolutionists from Sperber to Henrich to Heyes would not deny this sort of “individual” or “asocial” learning. My claim (and that of others, see Lewontin, 2005) is simply that independent learning and inference-making is vastly underestimated by such theorists. Insight is not only gleaned in heavily fused states—sometimes it is the (temporary or prolonged) separation from others that allows for a greater freedom and flexibility of thought.

A much more significant point made by Lewontin and others relates to the role of power and coercion in potentially forcing the transmission of cultural information or “memes.” I will let Lewontin make his point:

“In Richerson and Boyd’s formulation, cultural elements, ideas, tastes, languages, and attitudes are properties of individual human carriers who acquire them by a great variety of processes including conscious and unconscious imitation of others, direct teaching by parents, learning in formal educational settings, or by exposure to various forms of communication...[But] this model has some shortcomings. One is that much of one’s culture is not acquired from other persons. When I walk down the street in Florence I do not have to hear anyone speak or read any sign to know that I am not anywhere in America...Another [shortcoming] is that no model of cultural evolution of which I am aware takes account of power. The people of Bavaria are predominantly Catholic while Westphalians are Protestant, not because somehow Lutheranism was more appealing to northerners but because at Augsburg in 1555 the warring German princes and the Holy Roman Emperor made peace using the rule of *cuius regio, eius religio*, which allowed rulers to enforce their own religion in their own dominions and to expel those who were recalcitrant.”

(Lewontin, 2005, p. 9)

While Lewontin's critique regarding the importance of power or coercion in cultural evolution might be lost—to some extent—on memeticists or cultural group selectionists, such a point is certainly not lost on sociologists. Since Weber, sociologists have noted the ways in which individuals and interest groups use the mantle of religious tradition, or of secular legal bureaucracy, to enforce norms and habits of behavior. Contemporary sociologists like Collins (2001) or Turner and Machalek (2018) straightforwardly work these assumptions about power into their work, and in doing so, they add significant theoretical nuance to any overly broad assumptions about hyper conformity.

Turner's "Marxian selection pressures," for example, involves individuals competing to mobilize the public's emotional grievances for purposes of institutionalizing and enforcing a new moral order. Abrutyn's (forthcoming; Abrutyn and Van Ness, 2015) "Weberian selection," as another example, involves individuals competing as entrepreneurs to interpret existing cultural information, or institutional practice, in ways that either build ties between institutions or better galvanize resources within institutions. Although "Marxian selection" dynamics are more oriented toward galvanizing social movements, owing to grievances over perceived inequality, and "Weberian selection" dynamics are more oriented toward individuals competing for institutional prestige (respect) and/or power (control over coercive means, such as the military), in either case, existing conformities and status quo trends are being bucked, challenged, and potentially violently changed.

Note

- 1 I might add that, as articulated in this particular paragraph, Henrich's or Heyes' approach is quite compatible with the supposedly competing school of evolutionary psychology (e.g., Cosmides and Tooby, 1997). Most theorists agree on most things; it is a shame they don't realize it.

Memetics

“Memes” are units of culture, supposedly analogous to genes as units of nucleic acid. How close this analogy is, and to what extent memes (and their combinations, “memplexes”) can be evolutionary units of selection remains an open question, and an important open question. Memetic theories of culture are now reaching an adolescent stage of maturation, but important questions remain open about just what, exactly, a meme is and how it relates to cultural change over time.

Let’s put it bluntly: are ideas the DNA of culture? And, if so *which* ideas?

6.1.1 Origins of Meme Theory

The term “meme” originates in Dawkins’ ([1976] 2006) influential work *The Selfish Gene*, in which he argues that memes in cultural evolution are analogous to genes as units of information in biological evolution. However, it would seem that the actual *concept* of memes might have originated prior to Dawkins’ work, in the writings of anthropologist Eugene Ruyle (1973). Ruyle suggests,

“The behavioral tradition of a population is made up of the activity of individuals and depends on the ideas existing in the minds of individuals. The variable behavior of individuals, then, may be seen as the expression of the ideas of the individuals. The sum total of the ideas, including psychological drives, motives, cognitive maps, symbols, behavioral rules, norms, values, and so forth, of all members of a population constitutes the cultural pool. As the ideas in the cultural pool are expressed by individuals, they acquire an objective character of their own, confront the individual as an independent reality, and are, in turn, reabsorbed by the individual in the process of enculturation. Obviously, those ideas which are reabsorbed at a higher rate in this dialectical movement will tend to increase in the cultural pool, so that the differential replication of ideas by individuals plays a role in continuity and change in the cultural pool analogous to the role

played by the differential reproduction of individuals in the genetic pool, (Ruyle, 1973, pgs. 202–203).”

Ruyle, in short, thought peoples’ struggle for status and self-actualization drove their adoption of some ideas over others, leading to a “natural selection” of ideas. But, undoubtedly, this theoretical approach to ideas was carried forward on the shoulders of Richard Dawkins’ meme concept. So, we should really begin our discussion there.

What is a “meme” exactly? Dawkins ([1976] 2006, pg. 192) answers by way of examples: “tunes, ideas, catch phrases, clothes fashions, ways of making pots, or of building arches.” Another meme theorist, Dan Sperber (2012, pg. 180), adds “Irish stew, Little Red Riding Hood and Samba.” One gets the impression that any bit of cultural information can be a meme if it is capable of being differentially reproduced/copied/transmitted among people over time. More recent meme theorists give definitions that are more direct, although perhaps not always more conceptually helpful. For example, Maarten Boudry and Steije Hofhuis (2018, pg. 157) write that memes are “...piece[s] of cultural information [that exhibit] functional coherence [and spread] through a population forming lineages of descent...”

In a way similar to how genes spread from body to body during reproduction, ideas, phrases, tunes etc., spread from brain to brain in what Dawkins tentatively calls “imitation.” Genes use our genitals to replicate themselves sexually; memes use our bodies’ behaviors and expressions to replicate themselves cognitively. No doubt all of us have had a particular idea, song, or food recipe that we felt we just *must* share with others; just the same, there are particular ideas and songs which just stick in our minds for reasons opaque to us. This is memetic sexual reproduction—people develop motivations or urges to share “units” of culture with others, some of these bits of culture become remembered/imitated/stuck in the minds of others and the process continues. Dawkins cites, approvingly, the following characterization given by his colleague N.K. Humphrey:

“...memes should be regarded as living structures, not just metaphorically but technically. When you plant a fertile meme in my mind, you literally parasitize my brain, turning it into a vehicle for the meme’s propagation in just the way that a virus might parasitize the genetic mechanism of a host cell...the meme for, say, ‘belief in life after death’ is actually realized physically, millions of times over, as a structure in the nervous systems of individual men the world over,”(Dawkins [1976] 2006, pg. 192).

Or, sometimes, various ideas, beliefs, values, slogans and so on might emerge in peoples’ minds as a result of prior experiences or prior

conversations becoming jumbled and re-combined in the memory-formation process—meme theorists refer to this as ideational “mutation.”

But what determines the longevity of any spontaneous, mutated idea that springs forth from our lips, or that we hear from others? Dawkins isn't entirely sure but concludes that it must have something to do with the degree of *psychological appeal* of the idea, with this psychological appeal constituting a potential meme's “fitness” in a selection environment. After all, ideas must “compete” amongst one another for peoples' finite attention spans and memories. “Fit” memes are those that are more distinctive and memorable than others in the surrounding social environment. Fit memes are “salient, attractive, beautiful, titillating or otherwise deemed valuable by their hosts,” (Boudry, 2018, pg. 116). While memes might or might not provide concrete benefits to the individuals who hold them in mind (more on this below), memes must in some sense be “congruent with features of the learner's mind,” in order to be retained and spread to others (Fessler et al., 2014, pg. 1).

Memeticists also acknowledge that the selection environment can change; what idea, recipe, plan or symbol counts as distinctive or memorable can change over time. It is not merely that the evolution of the human brain has conferred a predictable set of appetites and attractions, but also that particular historical periods and epochs render certain bits of culture more important or attractive than others. Just as some selection in a biotic environment is stable (e.g., need for food) and some is variable (e.g., sudden prevalence of drought, famine, new predators), so too, some memetic selection in the “memosphere” (Dennett, 2001) is stable (e.g., people disproportionately remember counter-intuitive ideas, see Boyer and Ramble, 2001) and some is variable (e.g., a country during an economic recession might facilitate a wider spread of memes related to the economy or to economic/political legitimacy).

Any single “copy” of a meme, for example the notion of *evolution* you have in your head right now, is less important to the survival of the meme than the meme's replicative capacity. The concept of evolution in your mind might well be different than the concept in my mind, but the concept's *ability to urge us to share its contents* is what determines the prevalence of the concept in subsequent generations of people. This is true for the meme of evolution, and also for the meme of god, spaghetti, the European Union and Beethoven's Moonlight Sonata. Even if individual copies of these memes vary from brain to brain (because people have different or incomplete understandings), insofar as some shared semantic component is continuously, but differentially, replicated then we have what might be called a natural selection process.

But, if your notion of “evolution” and my notion of “evolution” are not identical copies of one another, in what sense do memes replicate like genes? The answer given by Dawkins, Dennett (1995), Deutsch (2011)

and others, is that there might be at least one element of the meme that is shared between us, and it is this element that is replicated. So, when you think of the concept of “evolution” you might think of different theorists, particular examples, or particular processes that I don’t think of, don’t understand or don’t know about. However, when the term “evolution” leaves your lips, something roughly like “slow changes over long spans of time due to differing survival and reproduction rates” is successfully communicated to me. There might be many peripheral, satellite-like aspects of the meme that are more distant and less semantically relevant to its core elements. For example, knowing what Ronald Fisher and John Haldane disagreed about in their shared formulation of kin selection is less relevant (though not irrelevant) to the core elements of the “evolution” meme, compared to comprehending evolution as “slow changes over long spans of time due to differing survival and reproduction rates.” Some memes will come embedded in memplexes (i.e., some memes are closely networked with other memes, as the meme “god” is with the meme “afterlife”) which might enhance (or reduce) the probability of transmission between people, but it is only the *most basic* elements of any meme (or of any memplex) that are thought to be reliably transferred between people during memetic “replication.”

In other words, “memes” should not be confused with the particular words, concepts or sentences used to convey them, just like “genes” are not the same thing as DNA molecules. Rather, a gene is the information contained *inside* the DNA molecules, and similarly, memes are the core elements of information conveyed by words, concepts or sentences (Boudry and Hofhuis, 2018). DNA molecules are vehicles for particular configurations of information; words, sentences, concepts and so on are, as well, vehicles for configurations of information.

Instead of all of these biological metaphors, how about a physics metaphor? We might characterize memes in a way similar to how atoms are often depicted, as a core nucleus surrounded by a cloud of electrons. The core elements of the meme are those symbolic or abstract bits of information that are most basic to the meme’s meaning. The wider “memplex” is akin to the cloud of electrons surrounding the nucleus; it is the constellation of details one might or might not know or remember regarding a particular meme. If we consider the meme “the Canadian national anthem,” there will be core elements which are recruited in the cognitions of most people, on average, who think about “the Canadian national anthem,” but there will also be aspects of the meme that are only barely correlated between people, such as when the anthem was written, who wrote it, or what particular words or phrases in the anthem mean historically.

Since Dawkins’ work on the topic, many influential accounts have followed from people like Robert Aunger (2002), Susan Blackmore (1999)

and Daniel Dennett (1995). The theory has also been significantly modified by people like Dan Sperber (2000) and Maarten Boudry (Boudry and Hofhuis, 2018).

Susan Blackmore (1999), for example, persuasively argues that the pre-frontal cortex of the human brain evolved so as to extract, store and spread memes to others. The human capacity for abstraction and storytelling is, in other words, an ability to generate and exchange memes. These memes, in the form of rules, laws, standards, norms and so on, are reified in institutional hierarchies, providing a social mechanism that ensures transmission of memes across generations. For Blackmore, it isn't uniquely important individuals who drive history, although, of course, history is expressed through individuals. Rather, more precisely, it is memetic selection processes, occurring because individuals must selectively (if imperfectly) imitate each other in order to advance their positions within institutions, that account for increasing societal complexity over time.

For Dennett (2001), some memes persist in a population simply because they feel good to think about. Consider the memes surrounding national heroes and icons, or the meme that death is but an illusion and life will continue on in heaven. Other units of cultural information might spread because they confer some kind of social benefit—the meme of “Lakers fan” spreads not only because when fans watch their team win they swell with pride and happiness, but also because these feelings are celebrated with friends (Dennett, 2006). Social benefits might also relate to status, with the adoption and expression of some memes serving to mark a person as distinguished, cultured, knowledgeable or on-trend. Memes might also spread because of their similarity to prior memes a person has held, or because of their compatibility with currently held memes.

For these theorists, whether or not a meme is adopted by an individual, or spread to other individuals, hinges on how “psychologically appealing” the meme is. Another way this has been phrased is to think of the human brain (passively) as having “content biases” which filter incoming information or (actively) as being “attracted” to certain forms of culture over others (much work could be cited here: Boyer, 2001; Heath et al., 2001; Mesoudi and Whiten, 2008; Sperber, 2012; Eriksson and Coultas, 2014; Heyes, 2018). Prior work does show that people have a preference for remembering and sharing information that: (1) is consistent with peoples' prior assumptions or stereotypes, (2) is minimally counter-intuitive (i.e., mostly predictable information but with a twist or unpredictable element), (3) is ordered in terms of importance, (4) is relevant to social relationships or social events (relative to asocial topics), (5) can be expected to confer financial or social rewards (6) contains emotional content (vs. devoid of emotional content) or is consistent with a learner's mood and, especially, (7) information with a predictive utility that helps people anticipate the outcome of events and (8) information about threats or dangers, sometimes referred to as a “negativity bias”.

Elements of memes which contain information regarding impending dangers and threats from the surrounding social and natural environment rapidly accelerate the adoption and propagation of a meme, perhaps above and beyond any other criteria (Blaine and Boyer, 2018). Many experimental studies have now demonstrated peoples' selective attention to, and sharing of, danger or threat-relevant information (Baumeister, 2001; Bebbington et al., 2017). This selective attention can be found as early as infancy and many of the stories and urban legends around us from an early age are chock-full of dangers and threats. One study of urban legends, for example, found that they contained about three times more information regarding dangers/threats/hazards than regarding any possible benefits (Fessler et al., 2014). Daniel Fessler and his colleagues frame the results of their particular study (representative of the many others) as follows:

“...compared to positive events, negative events more readily capture attention, are stored more readily in memory, are linked to a larger set of cognitions, and have greater emotional impetus...the combined effects of general negativity bias and negatively based credulity [i.e., a tendency to regard information about dangers as true] in the minds of learners should constitute an attractor that shapes the contours of cultural evolution: culture can be expected to exhibit an imbalance wherein information regarding hazards is more prevalent than information regarding benefits... People who view the world as dangerous...may be critical nodes in the transmission chains that mold cultures,”

(Fessler et al, 2014, pgs. 1,6).

We can't assume, however, that all people are equally susceptible to adopting and sharing danger or threat-related information. Obviously, the fewer the objective threats in an environment, the harder it will be to imagine them, but research indicates that people can and do successfully stretch concepts like “harm” “violence” or “bigotry” to include a larger and larger number of behaviors, thus maintaining a “struggle against danger” narrative for purposes of social coordination, cohesion, or collaboration (Haslam et al., 2020).

Still, we might suspect that threat-related memes are less common in more materially secure societies relative to less materially secure societies (Inglehart, 2018). We might also suspect anxious individuals, or low status individuals, to selectively read threatening interpretations into ambiguous or neutral information (Bebbington et al., 2017). Prior work suggests that very anxious people might engage sooner and longer with threat-related information and might disengage more slowly. Despite this tendency among anxious people, we must remember that even non-anxious

people will selectively transmit threat-related information. Some will just do so with greater frequency than others.

Memes are often intentionally cultivated by people we might call “memetic entrepreneurs.” Think, here, of those artists, intellectuals, entertainers and politicians who attempt to carefully craft the structure of a particular idea to make it as palatable to the public as possible. Often, these entrepreneurs are motivated by some perceived danger, problem, pitfall, inadequacy or threat. Indeed, institutional entrepreneurs who develop new organizational hierarchies or new productive branches/divisions might be doing so as an expression of the replicative capacity of the memes swimming in their heads (Dennett, 2001; Dennett 2006).

Others working outside of orthodox memetic theory point out several “social learning biases” that might drive the adoption or spread of memes. Indeed, much of the last fifty years of sociology could be brought to bear here, but I will stick to the specific, recent, cultural evolution literature (e. g., Chudek et al., 2015; Sng et al., 2018). Regarding learning biases, several are acknowledged by scholars working across theoretical paradigms: prestige biases, similarity biases and frequency biases.

Prestige biases refer to peoples’ tendency to adopt the attitudes, values, beliefs and behaviors of people regarded as skilled or successful (relative to those regarded as unskilled or unsuccessful) in their in-group(s). This bias is assumed to have been evolutionarily advantageous, because the ability to imitate models in the group most consistently able to procure valuable resources and social relationships would have influenced survival and reproduction, especially during precarious times. Similarity biases refer to peoples’ tendency to adopt memes if they happen to come from people who are arbitrarily similar to oneself, perhaps someone who shares one’s gender, race/ethnicity, or religion. Finally, frequency biases refer to peoples’ tendency to adopt those memes that appear to be the most prevalent in others and/or most prevalent among the people one is most familiar with.

Durham (1991) offers a further distinction: sometimes memes can be imposed on others (as when individuals endorse norms they do not privately support for fear of punishment), whereas at other times, memes are voluntarily shared with, and adopted by, others. There is, then, a certain degree of power or coercion that can influence the spread of memes¹. The concept of pluralistic ignorance captures this well—if a person thinks everyone else believes or behaves in a certain way, or is expected to, they might themselves reproduce this belief or behavior independent of their personal, private, endorsement of it (Prentice and Miller, 1996; Willer et al., 2009). Or, if a group leader has sufficient financial or symbolic influence, people might reproduce or adopt ideas, attitudes, plans, etc. consistent with their perception of the powerful person’s expectations/desires.

On the whole, memes can be placed in one of three broad categories: mutualist (i.e., their adoption or spread provides material or psychic benefits to people), commensal (i.e., their adoption or spread has neutral effects with respect to the people holding them) or parasitic (i.e., their adoption or spread confers material or psychic costs on people) (Dennett, 1995). No doubt many, if not most, memes bouncing around in our minds right now are neutral with respect to our biological fitness or social standing. My favorite song, type of food or painting are all usually irrelevant to my day-to-day experience. Yet, some memes, like the meme of celibacy or the meme that cigarettes are cool, would be considered literally parasitic by these theorists. A proud celibate person spreads the meme at the expense of not biologically reproducing and the smoker spreads the meme at the expense of reduced life expectancy. Other memes, however, might be mutually beneficial. For example, the meme that “hard work pays off” might lead to a promotion, a new cooking recipe meme might lead to healthier dinners or a new constructional engineering meme, such as the use of I-beam skeleton frames, might save lives during an earthquake. Often, memes will not contribute only to biological or social fitness, but to both in different ways. In the celibacy example above, no, the individual won’t biologically reproduce but if it is religious prestige they seek, then social or financial benefits might follow from their commitment to not reproduce.

It might not be obvious why memes containing empirically false or biologically or socially harmful content might propagate, but there are several reasons for this (Edgerton, 1992; Boyd and Richerson, 2007, Boudry and Hofhuis, 2018). When a particular idea is expressed by someone we are familiar with, or similar to, especially if that person has high status in our group, we are more likely to adopt the idea compared to an idea expressed by someone we do not know, are very different from, or who has lower (relative) social status. This is not always true—celebrities and other influential people we have never met might express memes that stick in our minds. This is true even when the meme is false or parasitic; if it is shared with us by someone we are motivated to affiliate with, we will be more likely to remember and share it with others. Or, perhaps, we might be less likely to analyze the meme critically. A perennial means of protecting the propagation of false or harmful memes is for the meme’s “host” to insist the meme not be questioned, doubted or examined too closely.

There are other reasons why memes containing false or harmful content might proliferate throughout populations over time. Some false beliefs, precisely on account of being flagrantly false, might as a result be intuitively appealing to people (Boudry and Hofhuis, 2018). The belief in heaven, or in reincarnation or in benevolent determinism (as when people say “everything happens for a reason”) are examples of false beliefs that are

very common, probably because of the comfort or structure they provide to people so long as they are not examined too closely.

Some memes are both true, to some extent, and harmful. For example, memes pertaining to why one should not expect social support from others, like “man is wolf to man,” “nature is red in tooth and in claw,” “everybody lies,” or “the heart is deceitful above all things,” can lead to unnecessary isolation, loneliness and anxiety. For foragers, threat relates to predators on a savannah; for people in rich capitalist economies, threat relates to a lack of help paying rent or healthcare bills, owing to unemployment during a recession. In either case, memes related to the unreliability or inadequacy of others can, insofar as they are adopted and shared, collapse weak-tie (and probably to a lesser extent strong-tie) social support.

Memes might also spread, despite being harmful or false, because they are not “falsifiable.” What I mean by “falsifiable” is that beliefs that are difficult to refute empirically might consequently spread because people do not perceive the belief to be definitively *untrue*. Many popular beliefs are unfalsifiable, or difficult to falsify, such as a belief in god, in aliens visiting earth, in any number of conspiracy theories, or perhaps, a belief in the multiverse as predicted by string theory in physics. That these memes contain core elements which are hard to definitively refute with empirical evidence should be considered a feature, not a bug, from the standpoint of memetic propagation.

Memes are, then, more or less falsifiable. The more falsifiable a meme, the sooner it will flame out in its rate of transfer between individuals insofar as evidence or experience accumulates pointing to its inaccuracy or empirical dubiousness. Just the same, if a meme is easily supportable with available scientific and/or experiential evidence, this should accelerate its propagation. And even if a meme is difficult to support or refute with evidence, it might still effectively spread for other reasons mentioned in this chapter, unencumbered by the burden of being either true false.

Memes that effectively motivate particular behaviors might also be more likely to spread (relative to memes that do not mandate specific behavior), regardless of their fatuousness or biological or social harmfulness. Propagation will be particularly accelerated to the extent that such behaviors constitute “credibility-enhancing displays” (Henrich, 2009), that is, behavioral displays of commitment to a particular bit of culture, be it a religious ideology, national anthem or sports team. For example, fasting for ritual purposes is a particularly common meme found throughout world religions, yet, the very propagation of this meme requires something difficult to do (forego sustenance for sustained periods). The difficulty of the behavior—its “costliness”—is not only illustrative of the degree of the fasting person’s commitment but, also by inference, the possible truth or usefulness of the meme itself. Others might adopt the meme, and the wider religious memplex, precisely on account of the degree of devotion

displayed to them. This devotion in itself serves as a selling point, as a mark of the meme's potential value, to observers and onlookers.

Despite the potential spread of false and/or harmful memes, the empirical accuracy and usefulness of a meme should not be understated as a factor in its "replicability." The best example is the concept of the "meme" itself; its usefulness as a term for describing the virality of thoughts is a testament to the true existence of this concept. True memes, helpful memes, socially integrative memes, these can persist precisely on account of their accuracy or usefulness. On this, Deutsch (2011, pg. 387–388) writes,

"But what sort of idea is best suited to getting itself adopted many times in succession by many people who have diverse, unpredictable objectives? A *true* idea is a good candidate. But not just any truth will do. It must seem useful... 'useful' in this context does not necessarily mean functionally useful: it refers to any property that can make people want to adopt an idea and enact it, such as being interesting, funny, elegant, easily remembered, morally right and so on... Such an idea is, or embodies, a truth in the broadest sense: factually true if it is an assertion of fact, beautiful if it is an artistic value or behavior, objectively right if it is a moral value, funny if it is a joke and so on."

I can't disagree. My intent here in this section has been to discuss what "memes" are (to the extent that has been discerned), and to describe something about what makes some memes spread at the expense of others. My own opinion is that the most important true and useful ideas we have, to the extent that they *are* true and useful, are those specifying the construction or maintenance of infrastructure! Boring, maybe, compared to memes associated with a catchy song, or the many memes derived from great literature. But we cannot forget that some memes are dependent for their emergence on specific material conditions, and that the most fundamental substrate of material conditions is infrastructure and the memes associated with better and worse forms of it.

My claim, then, is that all else equal, more useful or accurate conceptualizations of infrastructural units (i.e., sketches, instructions, principles, equations, diagrams and so on) will tend to be retained in a population over time compared to less useful, or less accurate, conceptualizations. However, engineering is much more than just equations, sketches and diagrams; being people, engineers are and have always been embedded in a larger cultural milieu. Engineering memes, throughout history, have been components of memeplexes, which would have influenced the extent to which any given good engineering idea spread or was retained.

Regardless of my particular interest in infrastructure, memeticists only need you to keep this in mind: ideas can be differentially retained or can

differentially proliferate, and only the most basic representation of the meaning of an idea is likely to be copied with any fidelity, if it is copied at all.

6.1.2 Are Memes Units of Evolutionary Selection Akin to Genes?

Dawkins (1976) defines a “unit of selection” in the following manner, consistent with orthodox evolutionary biology:

“[We must] begin by identifying the properties that a successful unit of natural selection must have...these are longevity, fecundity and copying-fidelity. We then simply define a ‘gene’ as the largest entity which, at least potentially, has these properties. The gene is a long-lived replicator, existing in the form of many duplicate copies. It is not infinitely long-lived. Even a diamond is not literally everlasting...”

(Dawkins [1976] 2006, pg. 35).

Longevity refers to some material stability of a unit across long expanses of time, beyond the lifespan of single organisms. Fecundity refers to the replicative capacity of a unit. At the gene level this would be a capacity to proliferate copies of itself in subsequent generations. At the meme level, this might be psychological appeal, or the tendency for a meme to be remembered and communicated with others in conversation. Copying-fidelity refers to the precision with which units replicate, and while genes seem to replicate stably, Dawkins admits that the same can’t be said of memes. When ideas, songs, plans and other bits of culture pass between people in a society, how much of what is communicated in any interaction gets transmitted—exactly—to the listener? 20%? 60%? 10%?

Dawkins insists that we consider memes as units of cultural information capable of *degrees of* longevity, fecundity and copying-fidelity. The longevity, fecundity and copying-fidelity of genes are, for Dawkins, an ideal typical example of a unit (or system of units) capable of evolutionary change. Memes needn’t reveal the same degree of longevity, fecundity or copying-fidelity as genes in order to nevertheless differentially replicate or be retained in a population.

The key point for Dawkins is that we ought to consider memes as the central units of “cultural” selection because individuals and especially groups of individuals are too short-lived and ephemeral to be stable units of selection over long stretches of time. He writes:

“...individuals and groups are like clouds in the sky or dust-storms in the desert. They are temporary aggregations or federations. They are

not stable through evolutionary time. Populations may last a long while but they are constantly blending with other populations and so losing [any stable aspects of] their identity....A population is not a discrete enough entity to be a unit of selection, not stable and unitary enough to be 'selected' in preference to another population,"

(Dawkins [1976] 2006, pg. 34).

Dawkins returns to biology to remind us that it is not the individual body that is the unit of selection in biological evolution, because even human bodies are too amorphous, changing and fleeting over time. It is, rather, the fundamental units of genetic material, the actual bits of acid that serve as informational inputs for the synthesis of particular proteins, as well as the capacity of DNA molecules to replicate themselves in identical fashion (with some small probability of error), that adequately constitute a physical, discrete, set of entities (i.e., genes) capable of being naturally selected over long timespans, leading to substantive, enduring, changes to species' morphologies.

So, on this account, the organizational structures and institutional arrangements that human populations create do not have the longevity, permanence and materiality of genes, but the specific core units of information comprising symbolic communication ("memes") *do* have enough of these characteristics to constitute units of selection as far as memeticists are concerned. Individual people and the groups they create, however, do not. For memeticists, only units of nucleic acid (genes) and units of cultural information as represented in the brain or stored externally in communication technologies (memes) constitute "units of selection".

And, remember the caveat that, as Dawkins himself admits, memes are not copied from person to person with any consistent exactitude. Thus, his argument is predicated on some core meaning structure transmitted between people when memes are shared or stored (which could in principle be mapped in the nervous system and in the brain), even if other, supplementary or peripheral, aspects of the meme are not transmitted or poorly transmitted between people. Even still, the copying fidelity of memes is likely vastly lower, on average, than the copying fidelity of genes. We are left to speculate as to which memes might be replicated or stored with the greatest earnest and specificity...

6.1.3 Are the Core Elements of Memes "Transmitted" or "Reconstructed"?

An important source of disagreement among meme theorists is whether memes are "copied" and "imitated" from others or whether they are reconstructed in the minds of observers (Sperber, 2000). Does change over time require cultural "replicators," transmitted from person to person, or is

cultural change a cumulative process of inference and reconstruction (with each person filling in the blanks of what the other person means with their own experience and assumptions)?

Dan Sperber has been a consistent defender of the latter take, and regard's Dawkins' meme theory as a blank slate theory of cultural change where the mind exists as some passive receptacle of units of cultural information from others (not quite a fair characterization of Dawkins, who takes an evolutionary psychological approach to the mind's contents, but for the interview where Sperber says this, see Sperber, 2005). Nevertheless, on the contrary, Sperber's "epidemiology of representations" approach conceptualizes people as co-creators of attempted meanings within any given interaction, with no implication of any particular stable, discrete, units of information transferring passively from brain to brain. Sperber insists that the meaning(s) contained within memes are roughly reconstructed by individuals and that, consequently, memes can spread among people without any high-fidelity copying process of memes' core elements from others.

For Sperber, in a way not too dissimilar from Blackmore (1999), the human brain evolved to attract and extract cultural information from others, store (some representation of) this information in memory and transmit (some representation of) this information to others in our social network (often in the form of stories and narratives about important institutions and people). And, like Dawkins, Sperber agrees that a "meme" must refer to some unit of information, not necessarily the object containing the information (i.e., a computer, or an instruction booklet, or a brain). Sperber will also readily concede the biases of the human brain to "extract" certain types of information, as discussed above. However, relative to a focus on particular, discrete, characteristics of memes which are said to be transmitted between people, Sperber focuses more centrally on the process of information reconstruction.

In his forward to Susan Blackmore's book, Dawkins addresses the challenge that memes cannot be "transmitted" in a way akin to genes because the copying fidelity between two communicating people is not akin to the copying fidelity of two sexually reproducing people. When two humans reproduce sexually, some mix of each partner's genes, in the form of gametes, are reliably combined to create a new entity. This new entity (a zygote, and eventually a fetus) has discrete chains of nucleic acid, arrayed on chromosomes, which can all be traced to one or the other parental gametes. Yet, by comparison, when two humans communicate symbolically, discrete units of information are not easily traceable back to past lineages, and ideas can be "fertilized" in one's head from countless sources, from peers to family to media. It is unclear, exactly, where one idea ends and the other begins (to some extent the same problem exists with genes, which often activate in clusters, not necessarily individually). But,

Dawkins says, unlike gamete fertilization which occurs absent any conscious directive process, memes are, often, transmitted with intention, and this intention to transmit one's memes to others can increase the copying fidelity of the information contained therein.

Where Sperber differs from other orthodox meme theorists like Dawkins, Dennett or Blackmore, however, can be illustrated using the example of origami (see Dawkins, 2004; Sperber, 2000; see also Boudry and Hofhuis, 2018). The particular case of origami is highly arbitrary, it is merely accessible as an example.

Dawkins points out how origami designs become transmitted between people, pretty faithfully, owing to individuals' intention to share a particular pattern of foldings which create particular images, and that this process becomes more and more habituated, structured or "normalized" the more people share the information. His argument in this example is that (1) people have interests in art, (2) paper can be used to make art, (3) particularly efficient or appealing strategies for folding paper to make art will emerge among creative people and organizations, and that (4) these strategies become common knowledge among those interested in paper art, thus crowding out or reducing origami memes that are less efficient or produce less appealing art. Once this happens, any new distortions or errors or mistakes that people make when attempting to learn how to make specific origami art from a teacher will be corrected against this normalized standard. In this way, units of cultural information can become standardized and copying fidelity can increase. As Dennett (2006) argues, human beings, in attempting to fit into existing status hierarchies, often actively strive to increase copying fidelity. An obvious example of this is when professors fix the typos of their students, so that students' writing can be more in line with some existing literary standard.

But, Sperber (2000) argues, this transmission process is much messier than Dawkins makes it seem. Not only does the teacher have an inevitably incomplete understanding of origami (inferred over time from their experiences), but the student is also drawing inferences about what the teacher is intending to show them. The teacher is reconstructing their notion of "origami" from (always potentially errantly encoded) memories, and the student is drawing on their own attentional resources in addition to their extant semantic memory and episodic memory in order to interpret the teacher's intent and instruction. Now, suppose the student decides not to continue following the teachers' instructions once the class is over, was simply too bored to remember them, or perhaps, the student follows the instructions but modifies them, intentionally or unintentionally, when sharing them with others. These (and others) are all, for Sperber, forms of selection acting on the transmission of memes (Sperber, 2012).

Instead of discrete units of information being transmitted or not transmitted, perhaps instead what is occurring is something of an interpretive

negotiation, contingent on the teacher's reconstructed memory, personality and status/skill and the learner's ability to draw on their own experience, understanding and motivation in order to learn from the teacher. Also, quite unbeknownst to the learner, past experiences and particular cognitive biases might influence how attracted they are to any given meme, and how likely they will be to encode it in memory.

For Sperber, the "copying" of cultural information isn't really what happens with memetic transmission. Rather, existing idiosyncratic cultural capital is recombined and re-interpreted anew every time people attempt to communicate a "meme" to one another. Certainly, Sperber would agree that the brain appears to be attracted to some ideas over others, that people pay closer attention to high status others, selectively attend to threatening information and so on. But he would disagree that a particular, discrete, unit of information is necessarily being "copied" between people when memes are transmitted.

As to the question of why certain memes (e.g., "canoe," "Islam," "makeup," "karma," "evolution") seem stable through time, Sperber points to how some memes are better "cultural attractors" of attention and memory than others. Those memes, for example, that best fit with peoples' prior experiences or stereotypes, are somewhat counterintuitive, pertain to important social relationships or events, seem financially or socially beneficial, arouse our emotions and those that seem related to danger or threats will be extracted from others, retained in memory, and shared more often. However, as far as Sperber is concerned, these are features of the human mind, not of memes. That is, the human mind harbors preference for emotional, social, threat-related, novel, expectation-consistent (and so on) information; the mind is doing the attracting and selecting of memes. A random assortment of memes will be canalized into just a few consistent ones, sharing similar qualities, upon being filtered through the consistent, predictable, processing biases of the human mind.

Here is Pascal Boyer's (2018) vivid description of the sense in which brains are attracted to some bits of cultural information over others

"...consider pouring a liquid on a surface that is not perfectly level. The liquid will run from higher to lower points, in the process creating small puddles, places where the liquid is trapped, so to speak...cultural transmission seems to work like the distribution of liquid on an uneven surface...because of the [cognitive] inference systems that make some notions easier than others to acquire, entertain, and transmit."

Rather than focus on the particular characteristics of memes which make them transmissible, Sperber suggests we consider how the human brain selectively extracts and *molds/reconstructs* information from others consistent

with its processing biases. In other words, we should understand memetic dynamics as occurring along a continuum, from more *preservative processes* (which serve to maintain particular core elements of information within memes) emphasized by Dawkins, to more *reconstructive processes* involving the ways in which peoples' existing biases and experiences are recruited to interpret others' intended transmission of memes (Acerbi and Mesoudi, 2015).

With reference to these two general processes, some have made the argument that two sources of variation in memes might be posited: "guided variation," whereby individuals are taught in trial and error fashion how to adopt a meme and "direct bias variation," whereby individuals preferentially extract and encode memes from others consistent with their past experiences and social or emotional biases. While the latter is more associated with Sperber, both Dawkins and Sperber acknowledge these sources of variation.

And, I should add here the very important point that *social environments* are also attractors of particular memes. This is a point that is often overlooked by memeticists, who often focus so intently on the individual mind as a receptacle for, or attractor of, memes. To their credit, the environment-as-attractor was noted by Claidière, Scott-Phillips and Sperber (2014). But it must be true that, in any geographic or virtual space where demographically or experientially similar people congregate for a prolonged period of time, certain characteristics or features of the environment will develop and be shaped in accordance with peoples' aggregate routine behaviors and habits. In sociological criminology, that people mold their environments in various ways—good and bad—is recognized across several theoretical schools including Social Disorganization Theory and the aptly named Routine Activities Theory (e.g., Jones and Pride-more, 2019).

It is plausible, then, that the sorts of ideas people retain about how to cook, find fresh water, or pass electrons through a circuit has to do not only with the evolved information biases of their brains, but also with the particular arrangement of people and objects in their environment. Some memes will spread more easily in intergenerationally "tight" social milieus, other memes will spread more rapidly in intergenerationally individualistic or "loose" social milieus. Similarly, some memes are spread among people more rapidly in materially and existentially secure social milieus; others spread faster under less secure conditions. Most obviously, societies with electrical communication technology will have a greater capacity to generate more "viral" memes (that is, memes widely and rapidly shared).

Let's move on to Sperber's definition of "replication," or the sense in which units of cultural information might be said to transmit from one person to another. Assume there is a meme, A, held by Sam. Let's suppose Sam attempts to transmit A to another person, John. Let's call this

instance of transmission of “A” from Sam to John, “B”. In what sense is “B,” existing in John’s head, a replication of meme “A” existing in Sam’s head?

Sperber (2000) defines replication as follows: (1) “B” must be caused by Sam’s verbal or nonverbal expression of “A”, (2) “B” must be similar to “A” in some relevant way and (3) John’s cognitive process of extracting “A” from Sam must contain an understanding of the sense in which his own understanding, “B,” is similar to “A.” Point 3 is particularly important because, as the example of infectious laughter shows, it is possible for one person’s behavior to cause my own (satisfying point 1 above), and for my behavior to be similar in relevant ways to theirs (satisfying point 2 above), but for me to lack an understanding of why this is (i.e., I do not necessarily know why that person is laughing, all I detect is an impulse in myself to laugh along with them).

Now, to the important question: if memetic transmission is predicated on a “heavy reconstruction on the basis of prior knowledge,” is this still “replication” in an evolutionary sense (Boudry and Hofhuis, 2018, pg. 7)? Just how much replication, or more precisely, what rate of copying fidelity, is necessary to drive cultural evolutionary processes?

I follow Eriksson and Coultas (2014) in offering the following summation. Certain forms of cultural information might be transmitted across time at differential rates because people (1) selectively encode, and retain, certain content in memory, (2) selectively retrieve and share/retell information, and (3) because people selectively listen to, or elicit, particular information from others. These are all processes that can, taken together, lead a particular idea to develop and change over time. Moreover, we can identify generic cognitive processes (e.g., memory encoding, verbal expression) that, in tandem with social learning opportunities (e.g., direct teaching, imitation) and information processing biases (e.g., information about threat or about social relationships is selectively remembered and recalled) can canalize the production of symbolic information across people in a large society over time.

Memetic theorists, today, seem to concede that “cultural propagation is partly preservative, but also partly (re-)constructive, to different degrees in each particular case,” (Claidière et al., 2014, pg. 3). Sometimes the particular informational content of memes is stubbornly reproduced when people communicate it to one another, perhaps because the meme is easy to remember or appears useful or provocative. Sometimes memes are taught to us directly. But, even then, we are not likely to retain or share what was taught if our particular sensibilities or interests fail to align with our understanding of the teacher’s intent or understanding. Also, of course, owing to the sheer volume of potential cultural information transmitted to us day-to-day, much of what we experience is only remembered temporarily; eventually, whether it takes a day or two centuries, a meme

may fade from our collective memories and from our expressions because it isn't relevant, efficient, or memorable any longer.

Note

- 1 The role of power/coercion in memetic transmission will not come as a surprise to sociologists. For them, there will be the opposite problem of reading coercion into *all or most all* memetic transmission. We cannot underestimate coercion, but at the same time, we cannot make the same magnitude of error in overestimating it.

The Evolution of Norms, Values, and Identities

Geert Hofstede's (1980) *Culture's Consequences* was an unusual work of cross-cultural social science. For one, he had analyzed 116,000 surveys from 88,000 IBM employees in 72 countries, making his sample size unusually large compared with the more traditional ethnographic or smallscale survey studies of the time.

Specifically, Hofstede attempted an analysis of culture along four dimensions: Collectivism-Individualism, Power Distance, Masculinity-Femininity, and Uncertainty Avoidance. For Hofstede, culture involved shared background assumptions about people and groups that could constrain or enable new types of behavior. Hofstede (1980; 1994) defined individualism-collectivism as the degree of preference people have for autonomy as opposed to preferring membership in groups. Power distance was a construct meant to measure the objective amount of, and acceptance people show for, unequal distributions of power in organizations or institutions. Uncertainty avoidance was the tendency people show to prefer absolute truths and clear rules or punishments when they feel threatened. Lastly, masculinity-femininity was meant to assess how assertive, competitive and acquisitive people in a society were on average, as opposed to how friendly, caring and concerned people were on average.

In his work, Hofstede shows the above four dimensions to be statistically measurable characteristics of culture that likely vary in time and place. He concludes that people display varied "mental programs" by virtue of socialization into their cultural milieu, and that these programs will tend to vary along the above four dimensions. Since its publication, cultural psychologists have assessed and integrated elements of Hofstede's work (especially his collectivism-individualism dimension) into a variety of different theories (Taras et al., 2010).

Hofstede's work has, however, largely been ignored in sociology (Baskerville, 2003). In fact, less than a decade after his book was published, scholars in sociology had begun documenting the fracturing of the discipline into countless arrays of sub-specialties with little theoretical coherence (Collins, 1989; Lopreato, 1989; Turner, 1989; Turner, 2006). Some popular theories in sociology that emerged in the 1980s and 1990s,

and which sadly dominate sociology today, explicitly denied the possibility of sociology obtaining cross-cultural truths (or, really, any objective truths) about the world (Giddens, 1990; see also Allan and Turner, 2000). Cultural sociology during this period largely abandoned “grand theorizing” in favor of focusing on cultural particulars, “middle-range” theories, and on delineating idiosyncratic differences between societies.

During this same period, however, there were some sociologists doing good work theorizing culture. Ann Swidler (1986), for example, published her influential article *Culture in Action: Symbols and Strategies*. In it, she suggests that via enculturation, people develop an idiosyncratic repertoire of habits and behaviors that, in essence, constitute a “toolkit” that helps the individual navigate hierarchies and organizations within a given society. Despite the usefulness of this approach to analyzing culture¹, sociologists’ focus was still mostly on individuals as agents instead of on cultures as historically developing structures.

In a recent review, Lizardo (2016) describes cultural sociology’s methodological bias toward textual analysis, hermeneutics, and phenomenology. Lamenting methodological homogeneity, Lizardo (2016) concludes his survey of the field with a call for a return to the “real Durkheim,” a scholar who refused to conceptualize culture in purely symbolic, non-naturalistic terms. The incoming editors of the journal *Cultural Sociology* echo a similar sentiment, describing a “Bourdiesian turn” in cultural sociology beginning around 2007. This turn involved increased focus on cross-culturally relevant concepts such as “cultural omnivores” (Lizardo and Skiles, 2012), “cultural fields” (Martin, 2003) “moral foundations” (Hitlin and Vaisey, 2013; see also Haidt, 2012) and theories of encultured motivation (Lizardo, 2004; Vaisey, 2009).

In furtherance of a mechanistic, cross-cultural sociology, I will here attempt to recast Hofstede’s foundational work in terms of the cultural psychology which followed.

7.1.1 Beyond Hofstede

Cultural psychologists Harry Triandis and Michele Gelfand are among the more influential scholars who have attempted to apply and extend Hofstede’s work (Chan et al., 1996; Triandis, 1996; Triandis and Gelfand, 1998; Triandis, 2004; Gelfand et al., 2006; Gelfand et al., 2011; see also Nisbett, 2010). Among other things, this work has further elaborated Hofstede’s collectivism-individualism dimension of culture. This elaboration draws on Fiske’s (1992) work in anthropology to hypothesize the existence of vertical and horizontal aspects of collectivism and individualism. Horizontal individualism—apparently typical of Northern European countries—involves people seeking autonomy without a high degree of concern for “standing out” or being recognized as individuals. Vertical

individualism—apparently typical of people in the US—involves people seeking both autonomy and public recognition. Horizontal collectivism—apparently typical of Israeli kibbutzim—involves people working together as (roughly) equivalent units. Finally, vertical collectivism—apparently typical of rural China—involves people integrated into strict status hierarchies, where they are clearly superior to some and subordinate to others, in pursuit of shared goals (Triandis, 1996; Triandis, 2004).

This research also supports Hofstede's contention that people in collectivist cultures tend to focus more on context than on content (i.e., more on how something is said, and less on what was said), and perceive in-group goals as more emotionally important than personal goals (Triandis, 2004). And, also intriguing, these researchers attempt to collapse some of Hofstede's analytical categories to create a more general theory of cultural similarities (for example, showing that vertical collectivism is, in fact, equivalent to the perceived legitimacy of power differences) (Triandis and Gelfand, 1998).

More recently, Gelfand and colleagues (2006; Gelfand, 2019; see also Triandis, 1989) have argued for a distinct structural dimension of culture ignored by Hofstede: *cultural tightness-looseness*. This construct of tightness-looseness refers to the number of norms in a society, along with how strictly these norms are enforced situationally (which Gelfand refers to as the "strength" of norms). Tighter cultures have stronger and more numerous norms, as well as more rigid hierarchies, relative to looser cultures.

Crucially, tightness-looseness is quite distinct from fission-fusion. This might not at first be obvious, so let me highlight this distinction here. Fission-fusion are states of collective attentional and/or intentional aggregation and disaggregation. Tightness-looseness refers, instead, to the number and strength of norms operative when individuals are fused. When co-present or otherwise attending to/intending with others, individuals might perceive a greater or lesser number of norms with which they feel they ought to comply. They will also perceive variation in the strength of norms, that is, the severity of sanctions regarding norm violation. I will be discussing in greater depth, in *The Dance of Innovation*, how people can be fused at varying levels of intensity, but the point is that tightness-looseness is a concept useful for understanding how porous the boundaries of fused states are, and how flexibly people feel they can act within those fused states. Fission-fusion, then, broadly refers to the rhythm of aggregation and disaggregation, whereas tightness-looseness refers to the number and strength of norms perceived when aggregated.

The "tightness-looseness" of culture is also analytically distinct from other correlated concepts, such as collectivism-individualism (which assesses in-group bondedness), uncertainty avoidance (which assesses perceived stress, owing to uncertainty), power distance (which assesses the perception that power is distributed legitimately), and masculinity-femininity (which assesses how competitive and nurturant people in a society perceive

themselves to be). Of Hofstede's original four dimensions of culture, none had addressed norms per se, and Gelfand and Triandis helpfully filled this theoretical gap.

In the intervening years, Gelfand and colleagues (2011; Gelfand et al., 2013; Gelfand, 2012) extended earlier work (Triandis and Gelfand, 1998) to show that tightness-looseness was not only analytically distinct from Hofstede's other measures of culture but empirically distinct as well. They found that cultural tightness was positively correlated, but statistically distinct, from uncertainty avoidance (Triandis, 2004), collectivism (Carpenter, 2000), and power distance (Gelfand et al., 2011). Hofstede's (2001) construct of masculinity-femininity was ignored, almost entirely, because norms for stereotyped "masculine" and "feminine" behaviors were only important, in Gelfand's model, insofar as they become ubiquitous and enforced (a tighter society) as opposed to more unstated and ignored (a looser society).

7.1.2 The Anthropological and Sociological Origins of Tightness-Looseness

The concept of tightness-looseness has its theoretical origins in anthropology and, more specifically, in sociology. This concept originates (insofar as any idea can be said to "originate" anywhere) within anthropology via the work of Pertti Pelto (1968) who was himself influenced by, among others, the cross-cultural sociologist Murray Strauss (Ryan and Straus, 1954).

Drawing from sociologist Murray Strauss, Pelto (1968) suggested that "looser" societies are those where:

- Norms are expressed with a wider range of alternative channels.
- Deviant behavior is more tolerated.
- Values of group organization, formality, permanence, durability, and solidarity are undeveloped, (Pelto, 1968, p. 38).

Tighter societies, Pelto observed, revealed a greater degree of the opposite characteristics: tighter societies had fewer avenues for expressing norms in culturally approved ways, deviant behavior was punished more severely and ethnocentric in-group loyalty was strongly socialized into children.

Pelto analyzed a sample of 21 non-literate, semi-settled, foraging and small horticultural societies in order to look for possible mechanisms underlying the degree of tightness or looseness in these cultures. His results revealed 12 predictors of tightness-looseness. Pelto speculated that these 12 measures were actually reflecting three central dynamics.

First, societies with a unilateral kinship system were tighter than those with a bilateral kinship system, perhaps reflecting individuals' greater

available autonomy in bilateral kinship systems in choosing which side of their family they most identify with. Second, societies that depended more on agriculture for subsistence were tighter than societies relying on foraging or fishing. Pelto argued that agricultural subsistence requires a greater coordination of people who need specialized skills for soil maintenance, planting, and successful harvesting. This greater need for teamwork and social coordination in agricultural societies, Pelto speculated, produced pressures for stricter and clearer rules because, of course, everyone's life depended on successful crop yields.

Lastly, Pelto showed that population density per square mile predicted cultural tightness. Pelto regarded this result as more easily interpreted—where many people live densely alongside one another, clear, enforced rules for behavioral compartment become necessary for stable, predictable, social interaction, and coordination. Where population density is low, people exhibit a greater variety and unpredictability in their behavior because, owing to sheer geographic distance, this behavior is less likely to directly impact another person.

In sum, kinship/lineage arrangement, economic dependence on highly coordinated behavior, and population density produced cultural tightening wherein norms become more often articulated, strictly enforced and ethnocentric. Using his twelve predictors of these underlying three dynamics, Pelto classified the Hutterites of North America, the Hano of Arizona, and the Lugbara of Uganda as the tightest societies, and the Skolt Lapps of Finland, the Cubeo of Brazil, and the !Kung Bushmen of South Africa as the loosest societies (in his sample).

Subsequent to Pelto, the sociologist Edward Boldt (1978) carried this research forward, suggesting, for example, that researchers distinguish between tight cultures where normative order is imposed *top down* from political or religious elites as opposed to emerging *bottom-up* in encounters with friends and family (Boldt and Roberts, 1979). Also during this period, the psychologist John Berry (1967) developed an ecological model of culture in which individual behavior emerges from varying group requirements revealed associated with subsistence mode (farming, fishing/hunting), settlement mode (nomadic, semi-settled, sedentary), and population density.

In fact, in an article actually predating Pelto's (1968), Berry (1967) describes the Eskimos of Baffin Island in Canada as more independent and normatively lenient as compared with the Temne of Sierra Leone, owing to the Eskimos' greater reliance on hunting and fishing. Hunting and fishing are more independent activities and, as such, these Eskimos required a relatively lower level of social coordination compared with the practice of rice farming characteristic of the Temne. Using a variant of Asch's (1951) line test of conformity Berry further found that the tighter Temne were

more likely than the looser Eskimos to conform to an objectively incorrect response supposedly given by an in-group member.

7.1.3 Gelfand's Analysis of Tightness-Looseness

To reiterate, Michele Gelfand and her collaborators (2006) provide a three-part definition of tightness-looseness: (a) the clarity, (b) pervasiveness, and (c) severity of punishment associated with social norms within societies. Societies with obvious, numerous, and strongly enforced norms are tighter than societies with subtle, fewer, more casually enforced norms. The former, unsurprisingly, also tend to contain more closed, rigid, hierarchies than do the latter.

Tighter societies can also be identified by their relatively lower levels of variation in cognition (attitudes and values will vary less between people in tight societies), behavior (behaviors and habits will vary less between people in tight societies), and organization (formal group structure will be less varied in tight societies). The mechanism reducing this variation, in Gelfand's model, is "felt accountability"—people in tighter societies are thought to subjectively experience a more emotionally embodied sense of responsibility towards others (often in-group others).

Those in tight societies will also tend to have more, chronically accessible, "ought self-guides," developed through socialization, which motivate the individual to pursue the perceived goals and expectations of the in-group (Gelfand, 2012). On the other hand, people in loose societies will have chronically accessible "ideal-self guides" which motivate individuals to seek and promote their own goals and expectations.

Reinforcing this embodied sense of tightness, people in tighter societies will also tend to be exposed to more encounters revealing a high degree of "situational strength." Meyer and colleagues (2010, p. 122; see also Cooper and Withey, 2009) define situational strength as, "implicit or explicit cues provided by external entities regarding the desirability of potential behaviors."² In particular, situational strength is composed of at least four aspects of situations: (1) the understandability or clarity of cues; (2) the cross-situational consistency of cues; (3) the number of cues within situations indicating that behavioral or ideational discretion is limited; and (4) the association of positive (or negative) sanctions with proper adherence to (or violation of) situational cues. In essence, strong situations are situations where behavior *feels* dictated/determined (even if it does not feel coerced).

And, because situational strength varies both within as well as between societies, tighter (or looser) societies will contain some situations that are stronger (or looser) than others (Gelfand et al., 2011). A well-known example offered by Walter Mischel is that of stopping at a traffic light—clearly this is a strong situation where your behavior is largely dictated by

the yellow, then red, light ahead of you (Cooper and Withey, 2009). Even in a relatively loose society, stoplights at intersections are an example of an especially “strong” situation.

The weakness vs. strength of situations varies between societies, and throughout our daily lives. Tight societies might have a larger proportion of strong situations, but they do not have a monopoly on them. Studies indicate that, cross-culturally, church services, job interviews, funerals and weddings are perceived to be the strongest situations whereas bars, public parks and one’s bedroom are perceived as being weaker/more ambiguous situations (Price and Bouffard, 1974; Schutte et al., 1985; Hough and Schneider, 1996; see Meyer et al., 2010 for a review). There is, of course, a great deal of variability in this, as, for example, in Greece where school and workplace settings are perceived of as stronger (i.e., admitting of fewer acceptable behavioral options) than they are in Estonia (Realo et al., 2015).

Gelfand’s model thus predicts that people in tighter societies (compared with looser) will be more directed by ought-self guides across a greater number and degree of strong situations. As a result, people in tighter societies are expected to be more likely to conform attitudinally and will behave more preventively and predictably³. Conversely, people in looser societies are expected to vary more in their attitudes, in addition to behaving riskier and more innovatively (Murray and Schaller, 2012; Gelfand, 2012).

This difference in attitudinal variance and conformity is facilitated inter-generationally via “broad” and “narrow” socialization practices (Arnett, 1995; Lakoff, 1996). Broad socialization is typical of a “nurturant parent” child-rearing style where punishment is de-emphasized and the child is encouraged to be independent and self-expressive. Narrow socialization, typical of a “strict father” child-rearing style, motivates children to be obedient and to conform to authority, while at the same time threatening harsh punishment for failure.

These broad/narrow socialization styles also, of course, vary within as well as between societies, just as does tightness-looseness, collectivism-individualism and other measures of culture. In concert with parental socialization, institutions within societies hone the impulse control, value systems and role performances of people differently depending on whether they are subjected to broader vs. narrower socialization practices. And, as Arnett (1995) notes, there are evident upsides and downsides to both broad and narrow socialization styles. Though societies employing broader socialization practices appear more economically innovative, crime and delinquency rates are also high, as is social unrest (in the form of public protests) and social instability (for example, divorce rates). On the other hand, societies revealing a greater proportion of narrow socialization experiences suppress (often forcefully) individuality and free expression,

but, people report a greater sense of community and enjoy higher rates of social stability and lower rates of social unrest.

To summarize: relative to looser cultures, tighter cultures have more, clearer, strictly enforced norms embedded in more rigid, closed, hierarchies. Tighter cultures tend to be more collectivist/in-group/kin-oriented, while looser cultures tend to be more individualistic, and less in-group and kin-oriented⁴. Both tight and loose cultures can be high in status or resource inequality (Gelfand et al., 2006), but it is also true that tighter cultures tend toward authoritarianism and the legitimation of existing power hierarchies (Neuberg and Newsom, 1993; Kay et al., 2009).

Gelfand finds that power distance and cultural tightness are, like collectivism and tightness, moderately correlated ($r=.47$ for collectivism and tightness; $r=.42$ for power distance and tightness). Regarding uncertainty avoidance, people in tighter (relative to looser) cultures tend to be more avoidant of uncertainty by both adhering to norms and situational expectations at higher rates in addition to exhibiting a greater willingness to punish deviants (Triandis, 2004; but see also Uz, 2015). And, again the inter-generational transmission of tight or loose cultural orientations occurs within *and* between societies.

7.1.3.1 The Importance of Threat Perception to the Tightening-Loosening of Norms

When people perceive threats in their environment, their felt need for social coordination grows. Alternatively, as the perception of threat recedes (relative to past experience or relative to prior generations) the felt need for social coordination wanes. Given that the major threats faced by humans—predators, pathogenic diseases, territorial disputes, social/civil wars, poverty—cannot be solved individually, reliance on others rises as danger and, thus vulnerability, seems increasingly imminent.

To demonstrate these relationships, at least with regard to societal threat and tightness-looseness, Gelfand and her collaborators (2011) published an analysis of 33 nations across five continents ($n=6,823$). Their investigation assessed the importance of several dimensions of threat, including present and historical ecological, pathogenic, and social threats.

Their findings were as unambiguous as they were generalizable: relative to looser societies, tighter societies (i.e., those that contained a larger proportion of people agreeing with statements like, “People in this country almost always comply with social norms,” and “There are many social norms that people are supposed to abide by in this country,”) had greater estimated population densities in the years 1500 and 2000, more frequent natural disasters (e.g., floods), a lower percentage of farmland and greater food deprivation, less access to potable water, and lower air quality. Tighter societies also exhibited greater historical pathogen prevalence,

more years of life lost owing to communicable disease and higher rates of infant and child mortality.

In addition to these ecological and pathogenic threats, tighter nations also had more territorial disputes with neighbors during the period 1918–2001, and were more likely to be autocratic, with state-controlled media and less public access to communication technologies. Additionally, tighter societies offered relatively fewer protections for individual rights and civil liberties and were significantly more religious (in terms of church attendance and belief in the importance of god in one's life). Tighter societies did, however, have lower murder and burglary rates, likely owing to their greater police per capita and harsher legal punishments (e.g., death penalty) relative to looser nations. People in tighter nations, perhaps related to the severity and repressiveness of law, also reported being less willing to engage in public political demonstration. Individuals in tighter nations were found to be more cautious, more self-regulating, and desirous of greater normative structure (Gelfand et al., 2011, p. 1103).

In Gelfand's sample, the tightest societies were Pakistan, Malaysia, Singapore, and South Korea, while the loosest were Ukraine, Estonia, Hungary, and Israel, although nations in general varied considerably. There was also agreement between people in different nations regarding the varying levels of situational strength in their societies, with job interviews, funeral ceremonies, and libraries regarded by people, cross-culturally, as the strongest situations. Weaker situations, with fewer normative expectations and situational cues, included spending time in one's room, at parties or at public parks. Nevertheless, despite these cross-cultural similarities, people in tighter nations still perceived significantly more situational constraint, from setting to setting, relative to people in looser nations⁵ (Gelfand et al., 2011).

Several years later these findings were replicated using data from all 50 states of the US (Harrington and Gelfand, 2014). In this study, a tightness index composed of measures of strength of punishment (e.g., legality of corporal punishment in schools), permissiveness (e.g., legality of same sex civil unions), moral order (e.g., state-level religiosity), and diversity (e.g., % of state population that is foreign born) accounted for over 45% of the total sample variance in tightness-looseness from state to state.

Harrington and Gelfand noticed a general correspondence between the supposed existence of "honor cultures" (Cohen and Nisbett, 1994) and culturally tight geographic areas of the US; their results indicated that the tightest US states are Mississippi, Alabama, Arkansas, and Oklahoma (Harrington and Gelfand, 2014). As expected, people in these states also experienced some of the highest levels of threat. Tighter states in the sample consistently had higher death rates, in part, a result of more extreme weather conditions from 1979 until 2004, in addition to higher levels of air and water pollution and higher rates of food insecurity and

poverty. Pathogenically, residents in tighter US states suffered from higher rates of mortality from the flu and pneumonia, a higher rate of HIV and chlamydia diagnoses, and a higher child mortality rate. Separately, Harrington and Gelfand (2014) found that tighter states had a higher proportion of slave-owning families in the 1860 census, relative to looser states. This is an interesting measure, as it indirectly indicates the degree of historical territorial threat likely experienced as a result of losing the Civil War.

As with the cross-national data, differences in cultural tightness between US states appear to be an adaptation of sorts, with the “goal” (often unconscious, of course) of reducing social instability. Tightness was negatively associated with residential mobility, the ratio of tourists to residents, the proportion of divorced people, the proportion of single mothers, the proportion of single males and the rate of homelessness (Harrington and Gelfand, 2014). On the downside, however, cultural tightness was also related to lower rates of entrepreneurialism and creativity. For example, looser states like California, Oregon, Washington, and Nevada had higher proportions of utility patents filed, in addition to more writers, painters and other artists per capita. Yet, these states also had higher rates of crime and other measures of social instability.

Gelfand (2019) sums up her work by discussing an optimal “goldilocks principle” of tight-loose social organization that would mitigate the downsides of both tightness and looseness. She suggests that her work points to a fundamental *tight-loose tradeoff* such that increasing tightness is empirically correlated with the benefits of conscientiousness, social order and increased individual self-control, but also with the harms of closed-mindedness, excessive rule-following, and a tendency to act in accordance with tradition even when this is known to be unhelpful or non-optimal. Conversely, looseness is empirically correlated with the benefits of out-group tolerance, creativity/desire for novelty and increased behavioral and ideological flexibility, but also with the harms of social disorder/disorganization, decreased capacity for coordination/collaboration and individual impulsivity/riskiness. A goldilocks principle of tight-loose balance would, theoretically, optimize organizations, institutions and societies to be able to respond to threat as needed (i.e., have the capacity to quickly coordinate people) but to also be capable of flexibility and new ways of behaving or believing. Elsewhere, Gelfand refers to this goldilocks principle as “tight-loose ambidexterity,” (e.g., Gelfand, 2019, p. 164), or the capacity to express “structured” looseness and/or “flexible” tightness.

Specifically, Gelfand suggests that the leadership of organizations, institutions and societies can tighten a loose organization by attempting to (slowly) institute policies that: (1) render decision-making more centralized among a smaller group of people; (2) increase the severity of the consequences for (formal) rule and (informal) norm violation; (3) introduce

new forms of bureaucratic surveillance, monitoring or oversight; (4) set or increase benchmarks for the belief and behavior expected of organizational/institutional/national role models and develop rewards for those meeting or exceeding these benchmarks; and/or (5) promote values emphasizing reliability, punctuality, respect for authority and a sense of duty or obligation. In a particularly loose organization, institution or society, interventions like (1)–(5) above will begin to move the social system more closely to an optimally “dexterous” tight-loose configuration. Too much implementation of (1)–(5), however, will cause the system to fracture into rebellious sub-groups that will complain the tightening is too extreme. Or, potentially, over-implementation of (1)–(5) could lead to a disorienting, rapid, destabilizing, pendulum shift from extreme looseness to extreme tightness.

Conversely, Gelfand (2019) describes the sorts of policies or interventions that might lead to the loosening of a very tight organization, institution or society. These include: (1a) decentralizing decision making process by allowing a larger proportion of people access to the process of rule/norm formation and enforcement; (2a) creating avenues for people lower in the hierarchy to critique and punish superiors or the rules and norms they enforce; (3a) allowing for flexibility in shared goals, or in means of achieving those goals; (4a) encouraging people to explore potential changes or reversals to existing policies, behaviors or ideas; and (5a) adopting policies restricting the influence of the group on individuals’ time, resources or behavior (i.e., promote unfettered individual decision making). Adopting and implementing some cocktail of (1a)–(5a) in a tight organization, institution or society will, theoretically, loosen its coordinating structures and increase the optimality of its operations. In other words, (1a)–(5a) implemented in a tight organization will reduce the potential for unproductive, de-motivating levels of conformity and regulation.

And, as I just mentioned above, too much implementation of (1a)–(5a) in a tight organization, can lead to the enclaving of people who regard the changes as too extreme or unnecessary. Or, over-implementation could lead to a rapid, destabilizing, shift from an inefficient tightness to an inefficient looseness. An exact specification of the “treatment” necessary for any given organization, institution or society to optimize its tight-loose ambidexterity is beyond the reach of current scholarship. However, with some certainty, we can say that tightening loose forms of organization and loosening tight forms of organization can be beneficial to the efficacy and coordination of groups.

7.1.4 Other Theories of Groupishness

In collaboration with computer scientist Patrick Roos, Gelfand assessed, via computer simulations, the likely consequences of strict adherence to

norms when threat levels in a given environment rise (Roos et al., 2015). They drew on evolutionary game theory to hypothesize that, if threat perception causes the emergence of strong norms, then those who adhere to such norms (and who punish violators) should find themselves at an evolutionary/survival advantage *only under conditions of high threat*. Under conditions of lower threat, adherence to norms and the punishment of free-riding transgressors should yield a non-significant survival advantage.

Indeed, Roos and colleagues (2015) found that under conditions of higher threat (i.e., when agents are operating in a space of lower fitness-relevant “payoffs” from the environment), norm-adherent agents in the simulation benefitted more rapidly from fitness gains compared to conditions where threat was lower (i.e., where agents operated in a parameter space admitting of a higher probability of fitness-relevant “payoffs” from the environment). In other words, when the reliability survival-relevant resources became more unpredictable, agents in the simulation that coalesced under stronger norms and social expectations often became oriented toward what few sources of reliable fitness payoffs still existed in the environment.

Norm strength is therefore expected to increase commensurate to the degree of threat perceived; when threatened, human individuals begin coordinating as an integrated, rigid social unit calibrated, as finely as possible, to their perception of viable fitness-relevant resources. Under conditions of lessening threat, this rigid, strong-normed social unit can begin to relax, allowing greater freedom for its constituent members so long as conditions remain (relatively) less threatening.

This account can (and should) be theoretically integrated with existing work on the life-history theory of behavior (Kaplan and Gangestad, 2005), the parasite-stress theory of values (Thornhill and Fincher, 2014) and the behavioral immune system (Schaller and Park, 2011).

The life-history theory of behavior (as I have modified it, following the lead of Baumard (2019) and others) posits that an animal’s motivation for autonomous self-development is, partly, a function of their perception of the stability and safety of their environment. In unstable and unsafe environments (or during unstable and unsafe periods), animals will seek protection by binding to others, sacrificing their interests to the group, and orienting themselves toward sexual reproduction. Conversely, in more stable and safe environments, animals will invest in their own individual development, orient themselves to their own long-term goals and, in general, live more “slowly” (e.g., have their first child later in life and so on).

Research shows, for example, that across all 50 states of the US, the teenage birthrate at the state level positively predicts the endorsement of (1) in-group concern, (2) authority, and (3) purity and negatively predicts endorsement of the moral values of individual, (4) care, and (5) fairness

(Van Leeuwen et al., 2014). Studies like this lend credence to the hypothesis that, when threatened, people will seek to inculcate themselves in tight, cloistered, closely-monitored collectives that encourage sexual reproduction. In the modern US, this might take the form of fundamentalist religious communities and, indeed, Van Leeuwen and colleagues also found that endorsement of the above moral values of (1)–(3) was positively correlated with state-level religiosity.

As regards the parasite-stress theory of values, prior research shows that one's perceived vulnerability to infectious disease positively predicts xenophobia, ethnocentrism, conformity to norms, a preference that one's children conform to norms, and a preference for other people who conform to norms (Murray and Schaller, 2012 Thornhill and Fincher, 2014). In addition, nations with higher rates of infectious disease are more likely to be authoritarian, religious and collectivist. And this is not a weak correlation: the association between parasite stress and preference for strong norms is stable and strong (about $r=.7$, $p<.001$; see Tybur et al., 2016).

What is important for parasite-stress theorists is that infectious disease be recognized as perhaps the most significant cause of juvenile mortality in human societies (Thornhill and Fincher, 2014; Volk and Atkinson, 2013; Inhorn and Brown, 1990). Given the mortally significant consequences and ubiquity of disease throughout human evolutionary history, these researchers see tightening responses as perhaps primarily oriented toward the avoidance of the *perception* of pathogenic infection. In other words, higher order symbolic representations used for purposes of cultural tightening (e.g., individuals' attempts at persuasive argumentation for new norms of social avoidance) might be physiologically co-opting parts of the body and brain adapted for immune responses. To the extent that social dissimilarity or unfamiliarity served as proxies for potential infectious risk in an ancestral environment, our "behavioral immune system" might motivate out-group avoidance under conditions of perceived pathogenic danger.

Shared norms and conforming behavior are also costly signals of group membership, as well as indicators of kinship or fictive kinship (Park and Schaller, 2005). Thus, perceptions of pathogenic threat might cue an immune response that motivates in-group (kin/fictive kin) association along rigid normative guidelines. Of course, in the ancestral environment in which humans evolved, this was not a surefire strategy for avoiding infection, because without a germ theory of disease, the specific importance of hygiene and sanitation would have been impossible for early humans to fully appreciate. Nevertheless, these scholars argue, conformity with norms that appeared not to lead to death or infection (even if these norms were in fact, orthogonal to infection), and that were touted by people who were trusted, similar and/or familiar, have may be the most

accessible strategy for billions of people hoping to avoid early death across millennia.

If this account has merit, we might expect peoples' "behavioral immune system" (as with their biological immune system) to be sensitive to the emotion of disgust (Curtis et al., 2011; Miller and Maner, 2011; see also Haidt, 2012). After all, lobsters and frogs have mechanisms for identifying disease (Murray and Schaller, 2016), yet, these animals lack the neurology to make the sort of deeply emotional, ethnocentric judgments that humans make every day. Just as we might pull back from a rotting piece of food, tightly integrated individuals who are committed to specific norms might also pull back in disgust upon seeing an out-grouper violating such norms. Disgust is an emotion that is both pathogenically relevant, and socially relevant, in determining people's behavioral responses to "foreign" organic material and "foreign" human beings.

Thus, the behavioral immune system is believed to be composed of motivations for in-group association and out-group prejudice, as well as a prioritization of in-group authority, conformity, and purity. These motivations serve purposes of (and have presumably been evolutionarily selected for) self-protection, affiliation, acquisition of mates and the stable provision of care to offspring, among other things (see Murray and Schaller, 2016). The evolutionary argument for the emergence of the behavioral immune system is that the large metabolic cost of fighting off infection produced selection pressures for other (i.e., social) strategies of disease avoidance. Of course, this behavioral immune system is constantly misfiring, leading people to draw xenophobic conclusions about the "polluting" influence of "foreigners," from outside, or "traitors," from within, one's society.

Indeed, these researchers hypothesize that the behavioral immune system is a very sensitive system that will tend to *over*-stereotype (Miller and Maner, 2012) because a false positive error (assuming infection where none exists) would have been a less fatal strategy over evolutionary history than a false negative error (failing to infer infection risk where one indeed lurks). Cognitions finely tuned to keep our bodies free of disease, then, may also implicitly and subconsciously, influence our social judgments of others (see, for example, Terrizzi et al., 2010; Aarøe et al., 2017).

7.1.5 Changing Values

Historian Ian Morris (2015) has argued that changing modes of energy extraction—from foraging to farming to fossil fuels—are intercorrelated with changing value systems. In fact, Morris goes further than this to suggest that a society's method of production causally determines the subsequent emergent value system of that society.

Foraging groups, for example, contain individuals that are highly interdependent on one another for survival. The daily tasks of life fall on everyone's shoulders: child-rearing, hunting, weaving nets or baskets, and so on are all shared activities (though a gendered division of labor does exist in most forager groups, see Kelly, 2013). This economic interdependence, in turn, motivates individuals' adoption of an egalitarian ethos, where members of the band are treated, for the most part, as political equals even if it takes effort to reign in the more egotistical members.

Yet, this close-knit social grouping also facilitates very intolerant, ethnocentric views of outgroups, with raiding and revenge-killing taking place commonly. Among foragers, there is an egalitarian *within-group* ethos, but an often intolerant *between-group* ethos. It is not that foragers never have mutually beneficial trade relationships with other groups, they do. Rather, it is that these between-group trade relationships tend not to be as relevant to individuals' likelihood of survival to the same extent that within-band hunting and foraging are. For this reason, the mode of production—interdependent but parochial—apparently determines the value system of foragers.

Morris (2015) makes a similar economic-determinist argument for groups that he calls “farmers.” Morris does not advocate for a linear approach to cultural evolution—human societies did not linearly lurch “forward” from foraging economies to farming economies. In fact, as I have labored to point out, many foragers also tend small plots of land, and, often, sedentary farmers pack up and begin living a more nomadic foraging lifestyle when the circumstances require it (e.g., during times of land circumscription, or when most arable land has been claimed by others, see Scott, 2017). Nevertheless, insofar as a group of formerly nomadic people become sedentary farmers, and especially insofar as the surrounding geographic locale comes under the control of a centralized system of political authority (with these emerging on a large scale in Southern Mesopotamia ~7000 BCE), a new value-system may begin to emerge.

This modal value system in “farming societies,” according to Morris, was (compared to nomadic foraging life) less egalitarian, more hierarchical and, also, slightly less tolerant of revenge violence and blood feuds, owing to large nation-state militaries attempting to enforce peace/quell instability throughout a claimed territory. Early kings did what they could to suppress violence within their territory because such instability could pose a threat to their legitimacy and ability to extract taxes. Still, even as violence among groups within territories declined slightly after the onset of early kingdom-formation, the concentration of wealth and political power had never been greater. Relative to the modal value system of foragers, then, people in farming societies tend to be more tolerant of hierarchy (and of differing levels of ancestral or occupational prestige) and relatively

complacent about inequality, but they appear also to be increasingly averse to interpersonal violence, raids and revenge killings.

If you, reader, are sitting there wondering how Morris could make such sweeping generalizations about “farming societies,” you’re not alone. Such immense generalizations would need to cover tens of thousands of societies (or more) of varying sizes across thousands of years. Our concept of “farming societies,” in other words, would need to accommodate whatever similarities existed between, say, Athens and Uruk, in addition to farming societies in our modern world.

What does Morris have to say for himself on this score? Well, he knows he is generalizing, he knows there are foragers in farming societies and farmers in industrial societies. He is drawing from Max Weber’s concept of “ideal types,” (see Morris, 2017, p. 9). Substantively, what Morris is doing is directing us to some of the important structural and cultural differences between these massive epochs of human history. This means, for example, that he is concerned with how the ideal-typical structure of farming societies (larger, more dense and more sedentary populations reliant on carefully cultivated/grown plants and animals) influenced people’s expectations about what sort of normative order “made sense,” or appeared intuitively acceptable or preferable. He acknowledges:

“‘Farming society’ is a huge category, embracing almost the whole of recorded history, but we can nevertheless identify a broadly shared set of moral values within it. At their heart is the idea that hierarchy is good. Hierarchy reflects the natural/divine order, in which some were put on this earth to command, and most to obey. Violence is valued according to the same principle: when legitimate rulers demand it, it is a force for good; otherwise, it is not. Farmers’ values were very different from foragers’ because farmers and foragers lived in different worlds. Capturing energy from domesticated sources imposed different constraints and created different opportunities than capturing energy from wild resources. Farmers could survive only in a hierarchical, somewhat pacified world, and they therefore came to value hierarchy and peace...among farmers as among foragers, values evolved to conform to material realities.”

(Morris, 2017, p. 92)

For Morris, a third qualitative shift in values has occurred with the transition to a fossil-fuel economy, that is, an economy reliant on hydrocarbons extracted from fossilized plant and animals. Structurally, fossil-fuel/industrial market economies contain large numbers of the public working in a locally or distally integrated way, across specialized industries. This is a coordination challenge of immense proportions, and again, Morris contends that people’s values “evolved” in response to these coordination

problems. This recent change in values has occurred over just the last several hundred years:

“Across the two centuries since the industrial revolution began and capitalism took off, the world’s population has grown 7-fold, its biggest city 25-fold, its stock of knowledge (by my calculation) 860-fold, and its energy capture more than 40-fold.”

(Morris, 2017, p. 257)

Fossil fuel societies are immense in size, containing populations with many specialties and interests as well as competing needs and preferences. Fossil fuel societies provide more occupational, recreational, and group-affiliation options for people traversing unprecedented distances across space. This degree of demographic and ideological diversity, including high rates of exposure to new people with new ideas during formative periods in one’s life (school, first jobs, first vacations) leads to another adaptation of our flexible emotional-value system. When people cannot be certain that those they go to school with, recreate with, work with or live with share their beliefs or particular cultural background, they tend to become more tolerant, more open and less insistent on the enforcement of parochial cultural norms (Bruce, 2011, Pettigrew et al., 2011).

For Morris, especially since the 1700s and up through the present moment, this “evolution” of value systems is evidenced by the historical fact that ideologies, narratives/mythologies and political platforms centering the scourges of political inequality, wealth inequality, gender inequality, racial and ethnic inequality and violence have never been more common, better funded or more supported. Obviously, this could potentially help to facilitate social co-ordination among highly diverse individuals circulating widely across space as they compete for prestigious positions across institutions.

But Morris risks simplifying things too much when he calls the values of tolerance, equality and openness “fossil fuel values.” In fact, Morris himself argues that these values can be found among foragers, who also disdain political inequality, wealth inequality and who have at least some degree of concern for gender inequality. But, isn’t there more to this story? What of the (albeit annoyingly chronologically broad) Axial Age religions? These were mythologies that emerged in farming societies, but they nevertheless emphasized a rather radical tolerance for their era. I do not think Morris would disagree. His point is not so much about the *emergence* of new value systems, but rather about the *widespread adoption* of them. And, while some well-to-do cosmopolitan aristocrats like Siddhārtha Gautama might have adopted an open-minded approach to cultural differences thousands of years ago, there is no reason whatsoever to believe that such tolerance was common

amongst political, military or religious elites or, for that matter, the population at large.

This is why Morris would probably be content to find “fossil fuel values” about the importance of tolerance and fairness, or about the importance of skill and ability (over bloodline) existing, to some extent, in ancient farming, and especially foraging, societies. Morris’s specific claim is that historians do not find evidence of a *widespread* public valuing of political equality (prevalent among foragers, but not farmers), fairness in wealth distribution (prevalent among foragers, but not farmers), gender equality (middling among foragers, low among farmers), or non-violence (middling among both foragers and farmers) until the emergence of an economy reliant on machines and coal, natural gas and petroleum.

Why, though, has poverty declined (or, we might ask, why concern with poverty has grown) in fossil fuel societies relative to farming societies? Morris’s answer is that, while increases in the size and density of populations tends to increase demand for hierarchy and normative order (see, for example, Gelfand et al., 2011), what has *really* driven the “evolution” of values is rising energy capture enabled by new fuel sources. Put in his words, increased population size and density is one of many *proximate* causes of changing forms of hierarchy in a society, but “energy capture is the *ultimate* cause,” (Morris, 2017, p. 224). A rising standard of living, increased longevity, greater technological capacity for geographic mobility and secondary effects, such as greater parental investment in children, all create new demands for educational, occupational, religious, and social opportunities. Governments in Europe beginning around the 1600s and 1700s began feeling the heat of the political pressure generated by these demands. As McCloskey (2016) puts it, political elites saw a not-terrible option facing them if they wanted to avoid being hung on the gallows—give into demands for public political representation, economic freedom, and property rights, but, in doing so, expand the total wealth and energy generated by the entire system. Granted, revolutions of the period gave royals few options for debate, but what resulted was nevertheless the “Great Enrichment” (McCloskey, 2016, p. 8).

Political scientist Ronald Inglehart’s (2018) work is compatible with Morris’s (in fact, his empirical findings directly undergird some of Morris’s contentions about historical change). I’ve mentioned Inglehart’s work already, in Chapter 2, but it is worth underscoring here.

Using data from the World Values Survey and the World Bank, Inglehart and his colleagues find that lower and middle income countries contain people who overwhelmingly share traditional and survival values whereas higher-income countries tend to contain people who express secular-rational and self-expression values. Inglehart writes:

“The cross-cultural differences [...] are huge: in relatively traditional societies, up to 95 percent of the public say that God is very important in their lives; in secular-rational societies, as few as 3 percent do so. In survival-oriented societies, up to 96 percent of the public say that homosexuality is never justifiable; in self-expression-oriented societies, as few as 6 percent say so. To a remarkable degree, a society’s values and goals reflect its level of economic development. Socio-economic development brings occupational specialization, rising educational levels and rising income levels; it diversifies human interaction, shifting the emphasis from command-obedience relations toward bargaining relations; in the long run this brings cultural change, including changing gender roles, changing attitudes toward authority, changing sexual norms, declining fertility rates, broader political participation and more critical, less easily manipulated publics.”

(Inglehart, 2018, pp. 41–42)

Inglehart surmises that where the likelihood of survival is lower and life is less stable, people will be more motivated to create tighter group boundaries, stricter hierarchies and stronger leaders. He calls this an “authoritarian reflex.” This reflex, he argues, is our species’ response to threats, it is how our species mobilizes for a fight to survive. Values become parochial and in-group focused, punishments for violations of group norms become strict and leaders are expected to be strong, autonomous decision makers (findings that share much in common with Gelfand et al., 2011; Gelfand, 2019).

But, especially since the end of the Great Depression and World War II, economic security, government social services, and relatively low rates of warfare have comforted people enough to loosen their group boundaries and hierarchies and to consider electing more empathetic, humanitarian, leaders. Inglehart does concede several apparent exceptions to this, such as Brexit and the election of Donald Trump, and he bemoans a recent rise of totalitarianism in the West. Inglehart links this recent expression of humanity’s “authoritarian reflex” to rising income inequality, job automation and outsourcing, climate change and other threats to survival.

Aspects of Inglehart’s thesis could certainly be challenged such as whether income inequality constitutes a threat to survival (I would readily concede that *poverty* does), whether the election of Trump or the passing of Brexit are obviously authoritarian movements (as opposed to right-wing populist movements albeit disliked by many) or whether artificial intelligence and occupational automation will necessarily lead to job loss (maybe it will just open up new sectors? And, who does Inglehart think is going to maintenance these robots or design and manufacture new ones?). There is also virtually no engagement with the problem of threat manipulation

(as by media, which might sensationalize stories for advertising revenue) or threat entrepreneurship (as by social movement leaders and the intelligentsia willing to catastrophize so as to fundraise, sell books, or fill classes). Threat manipulation and threat entrepreneurship can magnify people's perception of threat in a way that is out of proportion with the actual objective risk, and this sullies any straightforward assumption about "modernization" and declining threat perception.

But I am not here to critique so much as to integrate and synthesize. Inglehart's general thesis, which seems to me sound, is that institutions within societies differ across history in their capacity to ensure survival for individuals, and when survival is less certain, individuals' values will reflect a greater appreciation for in-group hierarchy, in-group loyalty, intolerance of "outsiders," and greater preferences for strong, possibly authoritarian, leaders.

Most importantly, Inglehart's findings are consistent with other cross-cultural studies by people like Hofstede (1980; 1994; 2001), Gelfand (2011) and others whom I have not discussed like Schwartz (2006). It is also consistent with the archaeology and history documented by people like Ian Morris (2015) or Robert Kelly (2016). In fact, Inglehart reports a single statistical factor underlying his Survival—Self-expression scale, Hofstede's Collectivism—Individualism scale and Schwartz's Autonomy—Embeddedness scale (just what it sounds like), and this single factor accounts for an astonishing 81% of the variation in peoples' responses to various survey questions cross-nationally (see Inglehart, 2018, p. 51). The tendency of human social systems to develop rigid in-group boundaries, hierarchies, punishments and strong leaders in response to the perception of threat(s) appear to be foundational axes of cultural variation.

Inglehart makes many important additional contributions. He shows, for example, that the *rate of economic growth* actually reduces national support for norms encouraging individual choice and expression, and he thinks this might be due to feelings of being overwhelmed or destabilized by rapid technological or economic changes. Insofar as these rapid technological or economic changes are perceived as threats, people might express their "authoritarian reflex," for a sense of comfort, protection or stability. Of course, the *level of economic development* as distinct from how fast an economy is growing, predicts support for self-expression values, consistent with the hypothesis that materially secure people are more tolerant and open-minded, all else equal.

Inglehart also suggests that there is more to a sense of security than income, access to goods and physical health. He notes that despite having similar income levels, ex-communist European countries differ markedly from one another in life satisfaction. People in Ukraine, Belarus and Bulgaria, for example, all report lower average levels of life satisfaction than people living in Slovakia, Croatia, or Poland (Inglehart, 2018). Inglehart

speculates that this could be due to the differential impact of losing communist-utopianism as a meta-narrative for societal policy and progress. Indeed, anytime a society of people loses hope in their mythology and ideology, the subsequent subjective perception of threat might be enormous. However, these effects will be uneven; not all societies are equally unified behind a shared utopian mythology, and not all societies lose faith in their mythologies at the same rate.

In sum, Inglehart's causal claim is that self-expression values rise inter-generationally with increasing longevity and material quality of life. If material conditions do not change, values do not change:

“A central feature of modernization is that it makes life more secure, eliminating starvation and increasing life expectancy [enabling people to] take survival for granted and give top priority to a wide range of other human aspirations.”

(Inglehart, 2018, p. 10)

That old Maslovian model of the hierarchy of needs would appear to be vindicated by this (and much other) work. And, once self-expression values are sufficiently prevalent in a population, social movement support for democratic governance will emerge and will tend to be successful. Inglehart ties the spike in countries adopting democratic forms of governance beginning in the 1990s with the rising global standard of living occurring in years prior. Conversely, countries with large proportions of people holding survival values will reject, or at any rate be very skeptical of, the usefulness of democratic governance; the failed (or, at least, very complicated) US invasion of Afghanistan in 2001 and the invasion of Iraq in 2003, both ostensibly to plant the seeds of democracy, are cases in point.

People often try and maximize their happiness (where “happiness” is defined as broadly as possible), but survival and safety will tend to take precedence. Cultural values, then, change according to a simultaneous two-step process, the first occurring *between* generations, the second occurring *within* generations: (1) younger generations of people develop political and social attitudes based on their perceptions of their material security relatively early in life, and these attitudes eventually replace those of older generations as the elders die off; and (2) social desirability/conformity pressures to adopt commonly held values (impinging on both young and old) can move a population toward a new modal worldview (Inglehart, 2018).

7.1.6 Changing Worldviews and Identities

There are many ways we might conceptualize the term “worldview,” but here, I follow the lead of Ann Taves (Taves and Asprem, 2018; Taves,

2018). Organisms of any kind navigating a changing environment will have some degree of the following framing their perception of the world:

- **Ontology:** as they grow, organisms check sensory/nerve experience against internally constructed models of the world in a weighted (i.e., weighted according to survival relevant concerns) Bayesian inference process. This process over time can lead to some level of subjective, but useful, world-mapping. *Ontology is the dimension of a worldview specifying what exists in the world.*
- **Cosmology:** in the process of creating a subjective representation of the external world, individuals will also generate some degree of self-mapping, which includes one's capabilities and incapacities vis a vis the environment and other animals. *Cosmology is the dimension of a worldview specifying who or what you are.*
- **Axiology:** a large part of what motivates the mapping of self vis a vis environment are goals associated with survival or reproduction (food, water, shelter, mating, avoiding predators and so on). This is, of course, owing to the fact that if species were not oriented strongly toward survival they would not exist long enough to reproduce. However, some species (mammals, some birds, obviously humans) can develop goals independent of survival and reproduction—goals associated with perceived group needs, or with idiosyncratic individual interests. *Axiology is the dimension of a worldview specifying what you should be doing and what is therefore right or wrong.*

Perhaps others could be added; Taves (2018) offers six, in fact, which I have collapsed (I think neatly) into the three above. The important point is that people expressing their “authoritarian reflex” in Inglehart’s terms, or “tightening” in Gelfand’s terms or “fusion in response to threat” in my terms might construct their ontology, cosmology and axiology in closer accordance with kin and perceived fictive kin, and less in accordance with their own independent critical reflection. Under conditions of threat, or when otherwise spending relatively more time in fused states, we might expect peoples’ axiology and cosmology to be more constrained by family and in-group expectations. Under such conditions, it is also likely that collectives (family, political party, religious community) will figure more prominently in peoples’ sense of self and of what is important in life. By contrast, individuals spending relatively more time in a looser or more fissioned state might develop their worldview in a more idiosyncratic manner, or with reference to more unfamiliar, potentially dissimilar high-status others.

Yet, often, the central actor within peoples’ worldviews, the centerpiece of their cosmology, is them. More specifically, their sense of self, or *self-identities*. Both Mark Moffett and Paul Smaldino have recently, independently,

developed theoretical approaches to the study of identity change across periods of cultural change. Let's look at each of their approaches briefly.

Moffett (2013; 2019) accepts the standard archaeology and history that, once people were more or less permanently settled in horticultural villages, inequality and technological sophistication began to grow. This was in large part due to the plain fact that sedentary living allows people to store (and hoard) more goods and materials; staying in the same abode permanently meant not having to lug one's possessions around every time a new camp was set up.

The relevant history should be familiar to us by now: as populations grew denser in these settled locales, people began to specialize more and more. People not only began seeking and storing more materials, trinkets and valuables, but they also began developing their own personal crafts more concertedly. Though, of course, most all were poor farmers, the tendency to tinker here and there with ceramics, iron work, textiles, weaponry, and the like could now proceed, unfettered by the need to stay mobile. Public demand for new goods and services grew along with the population, and more and more people began specializing in various activities to meet this demand.

Innovations in agricultural practice would sometimes raise crop yield productivity, which in turn could support more and more people pursuing niche specializations full time; these specialists could simply purchase needed food, wood and other resources from unknown co-citizens in a flourishing (if initially tiny by our modern standards) city market/bazaar. This is where Moffett (2019) gets creative: he suggests that this occupational specialization emerging in the ancient societies of history might have in part been motivated by individuals' desire for "optimal distinctiveness." Optimal distinctiveness is a concept developed by Marilyn Brewer (1991; 2012) to describe a fundamental need that people appear to have to differentiate themselves from others to some degree. The emergence of this desire for distinctiveness—that one ought not be too similar to other group members, but not too different either—seems to occur in adolescence, as people come to see themselves as an independent member of the social collective. After all, groups and societies cannot be *interdependent* without individuals having some degree of their relative *independence* from one another.

Now, certainly, in individualistic societies (or, we might say, in Western, educated, industrialized, rich, democracies, see Henrich, 2020), a desire for distinctiveness might be greater than in "tighter," and more kinship-intensive societies. But Moffett's (and Brewer's) point is not that all people seek to be maximally distinctive, but rather, that people have a tendency to want to understand themselves as unique, if interconnected, members of their societies. Interconnected because this assuages

uncertainty, anxiety, fear of an unknown future; unique because this motivates us to contribute to the group as a particular member.

A desire to be optimally distinctive would aid in societal coordination and innovation because it would motivate people to adopt hobbies or practices or interests or ideas that are perhaps slightly different from those around them, but not so different as to invite sanctioning or stigma. Even in the most collectivist, tight, closed society, people do not copy one another's behaviors exactly, and this is not only a result of unintentional copying errors. Moffett's key point is that this basic level of individualism—a trait Maryanski and Turner (1992) attribute to the last common ancestor humans share with great apes—could be expressed as occupational specialization as societies grew in size.

For Moffett, some culturally varying preference for distinctiveness could have motivated people to differentiate themselves from others in order to gain a reputation, and perhaps an income, doing so. Distinctiveness could not be too extreme in historical societies or today—taxes must be paid, local temple gods must be observed, citizenship papers must be filed—but some degree of occupational specialization could have both increased the variation of market goods and accelerated various forms of innovation contributing to an increase in the size and economic efficiency of societies. Consider that the US government alone tracks over 800 specific job titles across at least 400 industries (Bureau of Labor Statistics, 2020)!

Though Moffett does not cite Durkheim's ([1893]2014) doctoral thesis, he certainly provides a modern twist on it. Durkheim's thesis was that, in farming societies or foraging societies, people were fairly aligned in their life-experience and day-to-day activities: foragers all help each other with child and elder-care, seek nuts, berries, and tubers and hunt wild game; farmers all till and enrich soil, plant seeds, raise livestock, and harvest crops. For Durkheim, this shared economic existence produced in people a "common conscience,"—that is, a shared sense of identity. With growing occupational specialization and an expanding division of labor, people begin adopting new occupational identities and begin living quite different lives.

If the lifestyles and behaviors of foragers and farmers share much in common, we cannot necessarily say the same about the lifestyles and behaviors of firefighters and restaurant waitresses, or of poets and bridge operators, or of computer programmers and hotel staff. An expanding division of labor might increase internal coordination within a society (people can now specialize their talents on new products and goods because they can rely on others in their society to grow food, police their neighborhoods, fix their vehicles, etc.), but Durkheim worried that this increase in internal economic coordination might be met with a fractioning of a previously shared identity. His concern was that people might become more economically interdependent at the expense of losing touch with one another emotionally and morally.

But, I think, Durkheim overstated his case—ancient Rome or Greece or Egypt were “pre-modern” societies with economies reliant on farming, yet the degree of occupational specialization was significant (albeit not nearly what we see in modern industrial societies). We cannot, then, posit some simplistic transition between farmers, foragers and today’s hyper-differentiated labor force. Yet, to his credit, Durkheim does not suggest a simplistic transition between pre-modern and modern societies, noting that a common conscience can become frayed slowly over time. Despite this loss of a common identity, which Durkheim thought ancient societies relied on for maintaining cohesion and solidarity, modern societies have a new form of cohesion: occupational interdependence.

For Durkheim, then, a growing level of occupational specialization, and the consequent interdependent reliance on (perhaps unknown, unfamiliar) others for goods and services, constitutes a social fabric preventing dissolution and collapse. Even if I think that I have every reason not to like certain people in my society (because I assume they have different lifestyles or identities), if I am nevertheless reliant on them to help me educate my children, stock my grocery store, provide clean water, or fix the electrical wiring in my home, this produces a kind of instrumental occupational solidarity (which Durkheim termed “organic” solidarity).

Moffett takes Durkheim’s lead and pushes us to further consider how our broader social identities (not just occupational identities) might become more various and, thus, more interdependent with one another as well. He argues:

“[Across history, nations have become] exceptional not just in their ethnic plurality but in their richness of all kinds...[today] nations pride themselves on their wealth of job opportunities, religious choices, sports fandoms, and other interest groups. This cornucopia can amplify a society’s [resilience and internal coordination] by giving its citizens many options that add layers to their personal identities and affinities with others. Those able to reach outside their own ethnicity and race, or find commonalities with people like themselves yet with different outlooks, have the chance to bond over other shared enthusiasms; think of the study that shows that a person’s race may be overlooked should he or she be wearing the jacket of a beloved [sports] team [Cosmides et al., 2003]. Such cross-connections can be individually fragile but strong in bulk, keeping a society whole in the face of upheaval.”

(Moffett, 2019, p. 361)

I might not know my neighbor or my child’s teacher personally, but the proliferation of identities allows for the possibility that we might share a common sense of self (e.g., as fans of the same sports team or hobby or

book) and that this can spark a vague, but socially integrative, sense of familiarity or similarity. In other words, the less we know one another as particular individuals harboring specific worldviews and values, the more opportunity there is to relate to one another according to very general, more inclusive identity categories like “sports fan” or “national citizen” or “college graduate.”

Indeed, children as young as six (if not younger) show a preference to associate with unknown others who happen to share a national identity with them (Tajfel et al., 1970). This indicates that our sense of ethnicity is flexible and, potentially, very symbolically broad and inclusive of those we’re not personally familiar with. There’s also no reason to suspect that this capacity for fictive kin construction is limited to national identity—presumably any salient marker of group membership can satisfy the cognitive input criteria for generating affiliative motivations and/or reducing anxiety. Moffett (2013) also points out how the invention of writing and, later, mass printing and media allowed for the further proliferation of these identities and for (increasingly open) discussions about the broadness of the boundaries of these identities.

However, there might be a difficult problem looming. Given the rapid pace of cultural change, especially over the last fifty or so years, what “counts” as a relevant social identity has perhaps never been more in flux, never been less stable, within countries year over year. If people across a society fail to share definitions about salient identities (i.e., where there is widespread dispute over what counts as a “citizen,” “romantic partner,” “doctor,” “liberal,” “conservative,” or “religious,” and so on), they may not be able to consistently rely on shared symbolic commonalities in order to reduce the anxiety that comes from interacting with those with whom they are unfamiliar. The consequence could be a reduction in the aggregate potential for societal coordination and cohesion, leading to declines in economic, political and general institutional complexity. The problem, then, is not *only* that the meanings of our identities might become too broad or vague, but *also* that they might begin to change so quickly that people cannot draw consistently accurate inferences about others from them.

Paul Smaldino (2018, 2019) has articulated a similar position to Moffett (and Durkheim), and has also noted some of the concerns I just mentioned. Smaldino refers to the multi-dimensionality of roles and identities in large, complex, societies as a “coordination device” enabling cooperation. He writes:

“Individuals have complex and well-developed identities in all known societies. [However], I argue that in more complex societies, the landscape of possible identities is more heterogenous, and the multidimensionality of social identity is employed more directly as a

coordination device. Thus, the advent of social identities in modern complex societies, such as national or regional identities, religious affiliations, or various fan communities for sports teams, film, or music, may be indicative of a culturally evolved solution...to the problem of assortment for cooperation and coordination in an expanding world.”

(Smaldino, 2018, p. 457)

However, for Smaldino, large complex societies pose two basic coordination problems: (1) occupational, hobby, and social groups begin to contain more and more individuals with whom one is unfamiliar; and (2) as the diversity of identities grows, people might tend to become so flexible in their expressions of their identities that it becomes difficult to discern how they expect to be treated or interacted with across situations. Regarding (2), when we can no longer presume that people necessarily share an understanding of our occupational or recreational identities, all we can do is express the identity as broadly, flexibly and inclusively as possible. Of course, the same problem remains—if the identity is so broad, flexible, and inclusive that it does not adequately inform others about important details regarding who we are, then social cohesion can decline. Put in Gelfand’s terms, norms related to identities and behaviors can become so loose as to be unpredictable and devoid of usefulness.

No doubt, each of us contains multitudes. The various “selves” that we display to the world, and how we display these sides of ourselves, can aid us in navigating new situations and new people. Non-linearly, over time, as people traveled more widely over the life-course, interacted with others in (increasingly) open occupations and social clubs, and exchanged with others in enormous cosmopolitan markets, this coordination device of multi-dimensional self-hood became a more and more essential component of people’s cognitive and behavioral toolkits. Our portfolio of selves allows us to enter and exit a variety of circumstances and benefit from interactions with a variety of people. The more fluid and flexible our self-understanding, the greater our social mobility.

And yet, it is not this simple. As discussed above, if identity categories are *too* vague or general, or change *too* frequently, such categories will be insufficient markers of who one is vis a vis others. And, if we cannot relate to one another symbolically, and we are not family or friends, the potential for conflict, misunderstanding or avoidance rises. Perhaps, though, the threshold for vagueness is high—many ex-patriates and global travelers know the ineffable sense of comfort and familiarity that comes from encountering a fellow countryperson in an unfamiliar land. Even if one shares only a highly generic identity with those they live, commute, recreate or work around— as a “tech worker” or as a “mother”

or as an “American”—these symbolic cues can facilitate a sense of similarity or familiarity that *just might* be enough to sustain cooperation.

After all, how much “cooperation” does it take to enter a coffee shop and buy coffee from a cashier whom you do not know? How much “cooperation” does it take for produce to be delivered regularly to grocery stores? How much “cooperation” does it take for a college classroom of unfamiliar individuals to learn together? From the standpoint of other great apes like chimpanzees, who cannot consistently cooperate—at all—with others whom they do not know, human beings accomplish these feats with astonishing regularity. The lingering question, then, is: how shallow, how changeable, can our identities become before we no longer feel that we are living in the same society?

Notes

- 1 Indeed, in this very paper, Swidler makes the point, quite relevant to the present discussion, that in more “settled cultures” that are resistant to change, people will be more guided by enculturated values whereas in “unsettled cultures,” people will be more willing to employ their personal toolkit of cultural repertoires in achieving goals. There are parallels between this distinction and the distinction between “tight” and “loose” societies to be discussed shortly.
- 2 These authors also correctly point out that the concept of “situational strength” has its roots in sociological theory, in particular, in Weber’s concern for the impact of bureaucratization on individual behavior. To Weber’s ([1922]1978) work, one might also add work by Norbert Elias ([1939] 2000).
- 3 Interestingly, people in tighter societies evince a more “extreme response style” on surveys of their attitudes (in the sense of a greater likelihood of choosing responses at the extreme ends of answer categories), a finding dating at least to work by Hui and Triandis (1989). This might seem counter-intuitive given the higher rates of conformity exhibited by people in tighter cultures. Uz (2015) thinks that extreme responding is a result of people adapting to a general milieu where norms are clear and pervasive—where normative ambiguity is low, attitudinal ambiguity is resisted and more extreme, confident, worldviews are (relatively more often) advocated. It is also possible that the extreme responding characteristic of those in tighter environments is a straight forward reflection of actual lower (and perhaps more polarized) levels of attitudinal variance within the society (Gelfand et al., 2006).
More recently, Gelfand and colleagues (2013) suggest, alternatively, that people in tighter societies will perceive fewer avenues for social change (as available avenues are strictly monitored and norm-laden) and are therefore more willing to pursue extreme means of obtaining desired ends. Especially when societies are both tighter *and* more unequal in the distribution of resources people might perceive the engines of social change as distant in addition to guarded. Rates of terrorism, as one example of an “extreme response” to socio-economic frustrations, are therefore expected to be higher in tighter societies with greater levels of inequality.
- 4 Tightness-looseness and collectivism-individualism are related, but they are distinct analytical constructs. The correlation between tightness and collectivism is consistently moderate, not necessarily strong (Gelfand et al., 2011). So,

one might consider cultures that are collectivistic and tight (e.g., Japan), collectivistic and loose (e.g., Brazil), individualistic and loose (e.g., New Zealand), or individualistic and tight (e.g., Austria) (for more, see Gelfand et al., 2006). In Gelfand's (2012, p. 421) words, "Collectivism is related to the activation of the collective self and concern with harmony with one's in-group (e.g., family), whereas tightness is related to the activation of the public self and compliance with generalized expectations in one's society."

- 5 In one comparative study of people from China and the US (Mu et al., 2015), results showed that Americans considered fewer behaviors to be strongly inappropriate, and that, neurologically, a distinct pattern of electrical activity in the temporal and frontal regions was significantly stronger in the norm violation condition only among Chinese subjects. The authors concluded that cultural tightening had been "embrained" in the Chinese participants (and loosening in the American participants).

Toward an Integration and Theoretical Extension

“In every instance considered, natural selection will so operate as to increase the total mass of the organic system, to increase the rate of circulation of matter through the system, and to increase the total energy flux through the system, so long as there is presented an unutilized residue of matter and available energy. This may be expressed by saying that natural selection tends to make the energy flux through the system a maximum, so far as compatible with the constraints to which the system is subject.”

(Lotka, 1922, p. 148)

Much of this book has been about ideas, norms, values and behaviors. These are generic concepts in social science, and they are rarely used with any consistent specificity.

Because ideas, norms, values and behaviors are often nebulous concepts, some theorists, like Kim Sterelny (2006), have suggested that the study of cultural evolution be restricted to material objects. After all, once something like a “shovel” is invented either by some individual genius (less likely) or by some longer, social, more cumulative trial and error process (more likely), the shovel’s very shape provides both *prima facie* justification to others as for why it exists in the first place (“Ah, I can use this to dig more efficiently!”) and the information necessary to reverse engineer and thus replicate it (“Ah, I see how they made this, I bet I could make one of my own!”). Sterelny’s point is easier to see with examples of simple technologies, like shovels or spears, and harder to see with more complex, communally produced and utilized infrastructural systems, which would be hard for any one individual to comprehend and recreate on their own. Still, I suspect Sterelny is onto something with the hunch that we should be focusing more of our attention on *material, physical objects* instead of the fuzzy conglomeration of values, norms, and ideas bouncing around in people’s heads.

Let’s consider this a bit further. Presently, most memeticists, cultural group selectionists, sociologists and political scientists focus their attention on the intergenerational transmission of ephemeral, abstract “values,”

“norms,” “institutional logics,” and so on. Humans can generate all kinds of vague abstractions with their brains, but this does not mean any such imaginings have the permanence and discreteness required to be a unit of evolution over long expanses of time. I do not deny that ideas, values and norms are all more interesting and curious things to think about compared to the boring, monotonous, humming along of an electrical substation or the quiet funneling away of waste water in pipes underground. But just because our thoughts seem so utterly interesting to us and fun to debate does not mean that this is where the most proximate, causal, cultural evolutionary processes are taking place. You might have this or that understanding of religion, or this or that new trendy t-shirt or political affiliation. Who knows. You might or might not transfer some of the memes in your head to others. Who knows. This is all very interesting, I guess. But, regardless of what ideas are swimming around in your head, and regardless of who you insist must agree with them, what I will bet on is your use of the faucet, the toilet and the light switch.

8.1.1 To What Extent is Cultural Evolution Similar to Biological Evolution?

An entire book, or set of books, could be written on the formal similarities and differences between the biological evolution of species and the cultural evolution of societies. One dissimilarity worth noting upfront is that different societies are not like different species of animal. How strange would it be to notice differences in the construction of anthills and conclude that one was looking at different “species” of anthill! Societies—human or otherwise—are all “extended phenotypes,” of animals; they are extensions of individuals’ productive and creative capacities. Societies themselves are not different species, they are, rather, structurally different vehicles for the survival and flourishing of a particular species. This does not mean, however, that societies do not “evolve” in an important sense.

Orthodox evolutionary biology contains several postulates regarding the mechanistic processes of evolution (Campbell, 1974; Dennett, 1995). Most simply, theorists have identified three: (1) processes which reliably introduce variation in units of information and (2) stable selection pressures impinging on these units determining (3) which units are disproportionately preserved *or* propagated.

Point (3) is especially subtle, but important: sexual reproduction might not be a necessary precondition for evolutionary processes; *selective retention* (not only selective reproduction) of certain units of information can also provide the ratcheting necessary for an accumulation of modifications and/or adaptations. Others have called this process of selective retention “viability selection,” “selection on persistence,” “weak selection,” or “selection on survivors,” (Okasha, 2005b; Bourrat, 2017).

Let's think about processes (1)-(3) in a bit more biological detail before turning to how I suspect these dynamics operate at the societal level.

In orthodox evolutionary biology, the "fitness" of a particular organism is defined as its capacity to secure resources from the environment long enough to reproduce the units of information (i.e., genes) responsible for creating the structure of the organism. Organisms that live long enough to reproduce leave more of their genetic information in the aggregate gene pool of the next generation compared to organisms that do not live as long and therefore reproduce less often, if at all.

Of course, it is not just how long an organism lives that determines its likelihood of reproduction; other aspects of fitness, such as costly physiological displays (i.e., the peacock's tail) can increase the rate of reproduction by signaling higher mate value. Humans no doubt have some costly physiological displays of health and virility; perhaps height in males is a good candidate for a fitness proxy (see Nettle, 2002). But, beyond purely physiological cues of fitness, humans very often rely on (often in-group) displays of generosity to garner social support and mates. This has led some to suggest that displays of charity and the donation of time, effort or money for "good" causes is "the human equivalent of a peacock's tail," (Van Vugt and Iredale, 2013, p. 3).

Selection pressures arise when features of the organism and features of the environment interact in a way that systematically advantages organisms with some features over others. Sometimes these relevant features of organisms involve those that enhance survivability, sometimes it involves those that enhance attractiveness to mates. With regard to the environment, selection could be driven by predation, growing population density and competition, changing climate, or a general reduction in available resources. "Evolution," then, is what occurs over time when the units of information (e.g., genes) responsible for generating features (modifications and/or adaptations) of organisms become selectively reproduced (or retained) in subsequent generations such that the features, themselves, change in structure/form.

This sort of natural selection—where features of organisms interact with features of environments to produce differential rates of reproduction and, thus, modified features—is but one, central, force of evolution according to biologists. Others include nonrandom mating, transposable elements, genetic drift, mutation and gene flow (Mayr, 2001). Let's quickly review each.

Nonrandom mating refers to the tendency of individuals in a species to mate selectively with those who are more physically similar or familiar. Female fish that preferentially mate with males who feed in the bottom areas ("benthic zones") of a body of water will also preferentially mate with males who have visible markers indicating they feed in these areas (Mayr, 2001). Alternatively, females spending their time in more open-water

areas (“limnetic zones”) will rely on cues indicating that a male feeds in this region in order to decide whether to mate with him. Humans, unsurprisingly, do something very similar that biologists term “assortative mating.” In humans, this involves a tendency to marry and reproduce with individuals who have similar personalities, similar behavioral routines or similar socio-economic statuses and worldviews (Robinson et al., 2017). If this assortative meeting becomes concentrated in sub-groups, across many generations, this can in principle change gene frequencies in subsequent generations.

Transposable elements refer to some genes which do not remain fixed in a certain location on a chromosome (Mayr, 2001). These genes might be found along different sites on the same chromosome or might “jump” around the genome, leaving extra copies of themselves as they do so (Trivers, 2017). If Trivers and others are correct, genes compete amongst one another for the coding of proteins within a given individual’s genome. About this, Trivers writes:

“These were first discovered in 1938 by Barbara McClintock in corn—so called “jumping genes” because they failed to inhabit just one locus but jumped to new loci. Indeed, their defining property was that when jumping (or “transposing”) they produced extra copies of themselves that they promptly inserted elsewhere in the genome.... All species seem to have them. They can increase in a fly species so rapidly that within fifty years the transposing gene will go from no fly in the worldwide population [possessing] it to every fly has at least 25 copies,” (Trivers, 2017, pp. 7–8).

To the extent that genes “compete” to copy themselves (i.e., to the extent that genes are active, not passive, entities) this could be another process by which gene frequencies change over time. Indeed, Mayr (2001) notes one sequence of transposable DNA, known as “Alu” which exists in the form of 500,000 copies in any given individual mammal; this nucleic acid sequence constitutes as much as 5% of the human genome. Probably, other bits of transposable DNA are yet to be documented.

Third, *genetic drift*, refers to what might occur after a random event re-samples the genetic variance of a species. This might happen during an extreme natural disaster when who lives or dies is random and has nothing to do with individuals’ genes. The result is that the existing gene pool of that species gets stochastically reduced and, therefore, modified.

Fourth, *mutation*, refers to replication errors during cell division. This occurs when one gene’s base pair is replaced with another letter of the genetic code. Such copying errors are generally rare (although environmental exposure to radiation, for example, raises the rate of such errors) and often quite damaging. In principle, however, it is possible for a

mutation to increase an organism's ability to survive and reproduce in a given environment, and if so, this would, over time, increase the frequency of this mutation in the gene pool.

Finally, *gene flow* is a term used to describe changes in gene frequencies resulting from reproduction between individuals from two different populations. This could occur as a result of a high rate of immigration or migration between two populations. The concept of gene flow is important to evolutionary biologists because speciation occurs when one population breaks off from a parent population and begins reproducing in a relatively distinct geographic location. Gene flow, however, reduces the potential for speciation, because immigration and migration between different populations of the same species ensures there will be no significantly greater variance in the genes of one population from the other. And, as Mayr (2001) points out, individuals vary not only in how much they reproduce but also how geographically dispersed mates are. Individuals who are less "philopatric"—who reproduce further from their place of birth than others—theoretically contribute more to the process of gene flow than individuals who are more philopatric.

All this talk of genes, but what of bodies which, after all, are the structures doing the evolving? On this score, Dawkins (1976) distinguishes between a "replicator" (entities whose structure/informational content is copied with high fidelity during reproduction) and a "vehicle" (entities whose structure/informational content is not replicated, but is rather the proximate object of selection).

In evolutionary biology, genes are the paradigmatic replicators, because they are discrete bits of nucleic acid which contain the information necessary for the body to create the proteins that build tissue, bone, and other structures. These proteins are created when the particular information stored in genes (i.e., configurations of cytosine, adenine, guanine, and thymine) is "transcribed" into "messenger" chains of ribonucleic acid (RNA), which "transport" the information contained in the DNA of the cell's nucleus out into the wider cell structure, the cytoplasm. These chains of ribonucleic acid are then "read" or "translated" by cellular machines called ribosomes. In the ribosome, "messenger" RNA is translated into "transfer" RNA which is what begins forming the specific chains of amino acids that will be used as building blocks for macrostructures of the body like organs and tendons. The "replicators" (genes) thus give rise to "vehicles" (bodies) which house the replicators long enough for them to be reproduced in the next generation, should the "vehicle" survive long enough to mate.

Maynard Smith (1987; see also Lamm, 2017) has drawn a further distinction, even if it is mostly just one of emphasis. For our purposes, this distinction will be critical.

He distinguishes between what he calls "units of selection" (information that is retained or replicated; akin to Dawkins' "replicator") and "units of

evolution” (entities that evolve adaptations or modifications; akin to Dawkins’ “vehicle”). In Maynard Smith’s conceptualization, organisms themselves would be units of evolution, because they are the objects that express adaptations or modifications over time. The genes themselves remain unchanged (absent mutation), and simply exist as relative frequencies of copies.

However, statements about genes being the sole source of heredity are a bit misleading. Yes, genes are the building blocks of the functional physiological capacities of organisms, but if changes in gene expression in parents can be transferred to offspring, then some Lamarckianism is afoot. For example, if environmental stress exposure among parents changes how genes are expressed in offspring, then more environmental effects are likely operating on gene expression than is typically acknowledged in orthodox evolutionary biology (Maggert, 2019). Alas, this area of research moves us beyond the scope of my present argument, so I will need to set it aside.

How can we take some of these concepts and translate them into a logic of “group selection”/“cultural selection”? The concept of “group selection,” has many definitions—it is understood by biologists to be a selection of *genes for cooperation* between groups (Sober and Wilson, 1998; Wilson, 2012), it is understood by anthropologists and economists as a selection for *norms for cooperation* between groups (Henrich, 2017), and understood by sociologists as selection for *socio-cultural configurations* (values, behaviors, institutions, ideologies and other general concepts) in response to logistical loads as societies grow in size.

So, in what sense, exactly, are human social groups “selected” in a process of cultural “evolution”? I have taken some pains to put cultural “evolution” in quotes when discussing how the term is used by others. This is because of the enormous debate that exists about whether culture “evolves” in a way analogous to species of organisms, or whether culture merely changes and develops over time in entirely ordinary, well historically documented, ways. Let’s look a bit deeper into this debate.

Any group-level selection (as distinct, if related to, individual-level biological genetic selection) leading to cultural “evolution,” would require strictly bounded, closed-border, groups. In order for group traits—norms, values, laws, ideas—to be “selected” for their capacity to increase group cohesion, these group traits must be located in clearly delineated groups in direct competition with other clearly delineated groups for influence or survival. Do humans really live in homogenous, bounded, groupings? Maybe foragers did, but what of people in large, populous, ancient Mesopotamian (and later) city-states? Are religious or political groups of any significant size ever really homogenous or very strictly bounded? It seems extreme to characterize human social group boundaries as akin to the boundaries of skin or exoskeleton protecting the genes of animals.

As I see it, human groups, especially large human groups in densely populated urban areas, are quite porous and fluid in their composition over the days, months, years, and decades in a way that biological organisms are not. Perhaps I am discounting the complex and fluctuating microbiota that are essential to the survival of individual human beings, but it would seem that the fundamental components of groups—the people in them—change and shift more frequently than most of the fundamental components of human beings.

However, this does not mean that the tendency for animals to gather into groups does not have fitness consequences on individuals. And, if there is, indeed, an average fitness benefit for individuals that are members of cooperative groups, then the mathematical equations can be written to express this as a group-level fitness increase. Indeed, Hamilton said explicitly “*most* selection processes [have components] at group, individual and haploid levels and [we should] talk about the relative magnitudes of these components, rather than try to force all effects to submit to any one term,” (as quoted in Okasha, 2005b, p. 1000).

So, there you have it: sometimes, group membership can confer survival benefits to the individuals composing the group, making the group an important second-order “vehicle” for the survival of genes. This is not so much the problem, though. The problem regards how permanent these groupings are over time. If individuals enter and exit groups more often than they reproduce sexually, or alternatively, if individuals start new groups and abandon old groups more often than they reproduce sexually, then there will not be the group membership-permanence necessary to consistently impact the frequency of genes being transmitted from one generation to the next.

Okasha (2005) helpfully points out a distinction made by Damuth and Heisler (1988) between two different types of multi-level selection in evolutionary processes. In the first type, individual organisms are the central unit of evolution, and “group fitness” is calculated as the average fitness of the individuals comprising the group. In the second type, individual groups (aggregations of organisms) are the focal point of selection, and “group fitness” is calculated as the expected rate of proliferation of “offspring” groups. This second form of selection would, then, act on some aspect of “group character,” such as the norms, values or patterns of organization typical of the group. Yet, again, for this selection to take place on a group’s “character,” there would need to be some degree of stability, and thus homogeneity through time, of various norms, values, routine activities and so on. I just do not think that group values or norms, transferring from brain to brain at varying degrees of fidelity, satisfy this condition of continuity through time.

In an essay entitled “The False Allure of Group Selection,” Pinker (2016) summarizes many critiques of group selection. These critiques are

regarded as authoritative by evolutionary psychologists and many other social scientists. It will be worth spending the time to briefly walk through each of Pinker's critiques of group selection.

First, he suggests that certain conditions must hold in order for natural selection, properly called, to occur. In particular, he insists that natural selection requires precise, differential, replication producing some cumulative set of adaptations. He writes:

“When a river erodes the soft rock layers on its bed and leaves behind the harder layers, or when the more volatile compounds in petroleum evaporate faster than the less volatile ones, one hardly needs to invoke the theory of natural selection. One can just say that some things are stronger, or longer-lasting, or more stable than others. Only when selection operates over multiple generations of replication, yielding a cumulative result that was not obvious from cause and effect applying to a single event, does the concept of natural selection add anything.”
(Pinker, 2016, p. 869)

Second, he insists that group selection theories typically amount to rather average historical arguments about the importance of this or that cultural factor in the spread of societies. There is nothing wrong with this, but it would be misleading to apply the very technical term “evolution” to commonplace understandings of historical change and development. On this, he writes:

“There’s no end to the possibilities for pointlessly redescribing ordinary cause-and-effect sequences using the verbiage of natural selection. Cities have more old buildings made of stone than of wood because of the process of edifice selection. Cars today are equipped with steel-belted radials because they outcompeted polyester-belted tires in a process of tire selection...so-called group selection, as it is invoked by many of its advocates, is not a precise implementation of the theory of natural selection...[rather], it is a loose metaphor, more like the struggle among kinds of tires... It won’t work to...say that group selection is really acting on the norms and institutions of successful [nations]. The problem is that this adds nothing to the conventional historian’s account in which societies with large tax bases, strong governments, seductive ideologies, and effective military forces expanded at the expense of their neighbors. That’s just ordinary causation, enabled by the fruits of human ingenuity, experience, and communication. The truly Darwinian mechanisms of high fidelity replication, blind mutation, differential contribution of descendants to a population, and iteration over multiple generations have no convincing analogue.”
(Pinker, 2016, pp. 870, 878)

Third, Pinker notes that groups do not have the properties necessary to be objects of selection; they do not, strictly speaking, replicate. That is, groups do not create exact copies of themselves at differential rates. Groups do grow and split off, but there is, for example, a great deal of variation in the tasks and goals of various divisions and splits in a company. So, when group selectionists speak of “selection” they do not really mean selection on certain groups leading to differential rates of group replication. Instead, they mean that some groups are selected for “some analogue of success like size, influence, wealth, power, longevity, territory, or preeminence,” (Pinker, 2016, p. 870). Pinker concedes that a group’s growth in size, influence, wealth and so on are all very impressive to us human observers, but he insists that this is not what evolution by natural selection, strictly interpreted, involves.

As far as Pinker is concerned, group selection is a popular idea because of the power that Darwinian theory has had in unifying the biological sciences, and because people cannot help but notice that some groups last longer and are larger or more influential than other groups. The combination of these observations, though, errantly leads people to use Darwinian explanations where they are not appropriate. After all, social science is in desperate need of some degree of theoretical unification, and the *raison d’être* of social science is to explain why and how groups differ—the allure of group selection, as an analogy to Darwinian natural selection, is just too strong to resist.

So, I will not bother resisting. But I will reformulate cultural “evolution” to show that it is a new form of Darwinian natural selection, commensurate with, but also in important respects different from, the form of selection that occurs on genes in individual organisms. My reformulation will integrate the concerns and insights of all of those above—there is, I think, a middle way.

8.1.2 Change, Development, Evolution: A Modest Proposal

I will attempt, here, a synthesis. The central point that I hope to make is that cultural evolution is a specific, not a general, process. And, it is analytically, if not empirically, distinct from what I would call “cultural change” and “cultural development.” For the specific process behind cultural evolution, that is, the evolution of infrastructure, please refer to the follow-up to this volume, *The Dance of Innovation*. Here, I will sketch the broad contours of the differences between cultural change, cultural development and cultural evolution.

Cultural evolution, in particular, refers to (1) the process occurring when various forms of infrastructure are made and remade across human history because (1a) the engineering principles describing their construction or maintenance were (1b) storable in communication technologies (beginning with the first “innovation” in communication technology, the large human prefrontal cortex), which allowed for (1c) the intergenerational transmission, with modifications, of this information.

Over time, infrastructural units, and the infrastructural systems they compose, develop modifications and “adaptations” for greater energy extraction, processing and distribution. By “energy,” I mean the capacity of a society to “do work,” as Webber (2019, pp. 3, 8) writes:

“energy is the capacity to do work. That is, energy is the ability to do interesting and useful things. It is the potential to harvest a crop, refrigerate it, or fly around the world. The corollary is thus that a lack of energy is the inability to do work...” [energy enables medical professionals to] save lives [with] scalpels and other instruments made from metal forged with fossil fuels, lighting to allow surgeons to see clearly, medicines made from petrochemicals, plastic devices made from natural gas and electricity to heat water for disinfection.”

If one prefers more specificity, we can say that “energy” is whatever the body can turn into nutrients and glucose, as well as access to sources of (or machines/devices dependent on) electromagnetic, chemical, thermal, kinetic, electrical, or nuclear energies (Smil, 2017). Regardless, the greater the energy flow, the greater the potential for public participation in civic and intellectual life, and thus the more open fission-fusion oscillation becomes, in turn accelerating innovation.

Below, I will make a case for keeping these terms—change, develop, evolve—analytically distinct even if there is, in fact, much theoretical overlap. Again, for a full engagement of the processes behind, and historical instances of, infrastructural evolution, refer to *The Dance of Innovation*.

8.1.2.1 Cultural Change

Cultural change occurs when variation in cultural information (“memes,” and/or norms, beliefs, behaviors) is subjected to a process of “competition” for memorability or prestige. The memorability of cultural information is determined by variables like degree of social content, counter-intuitiveness, degree of danger, or threat content, and so on. The prestige of cultural information is influenced by the degree to which it is adopted (or perceived to be adopted) by individuals or groups occupying high-status positions within institutions.

The sort of group selection described as “cultural group selection,” pioneered in important work from Cavalli-Sforza, Boyd, Richerson, or Henrich, describes how and why cultures might change. Some norms are more conducive to in-group coordination and cohesion, and these are likely to spread because groups with those norms will outlast and “outperform” (i. e., economically, socially, or militarily) groups that do not have such norms or have fewer of them. The memeticists, from Dawkins to Sperber, also have much to say here about cultural change—some memes are more

memorable and attract more of our attention than others, and some bits of cultural information will be reliably molded to fit stable perceptual biases. Some components of some ideas and behaviors, in this sense, will be selectively recalled, retained, and communicated intergenerationally, potentially leading to cultural change.

Cultural change happens in other ways too. As many have noted, organizations that use resources more efficiently will tend to outlast those that use resources less efficiently. Also, more pertinent to our purposes here, the degree of energy made available by core infrastructure can influence what behaviors or ideas are likely or possible. For example, whether fresh water and electricity are easily accessible will influence how many children can attend schools where they will learn to read novels, compose prose, or write computer code.

Yet another way culture changes, of course, is in response to social movements and political uprisings. So-called peasant-rebellions and slave-rebellions were not uncommon throughout history and all are recognizable responses to the perception of inequality and arbitrary restraint (Moore [1966] 1993). However, those who study contemporary societies find that social unrest and protest are more common—on account of being more allowed—in democratic societies compared to more authoritarian societies (Skocpol, 1982). Not only are social protest movements more common in democracies, but they are more often successful when they're nonviolent (Chenoweth and Stephan, 2011). This is likely to be the case for common-sense reasons: in a democracy, it is legal to raise money and advocate passionately (potentially, paid, with benefits) for a cause. If fundraising, messaging, networking, and political lobbying are all successful enough, laws can be changed. However, in an authoritarian regime, protest and civil disobedience are often suppressed punitively, and harshly by the police or military, making political fundraising and lobbying difficult, if not impossible.

In sum, cultural change is the process of any information transfer over time. At the level of cultural change, “information” can be defined very broadly so that it is inclusive of all symbolic, and associated behavioral, expression.

8.1.2.2 Cultural Development

Cultural development is something a bit different, but it absolutely co-occurs with cultural change, and it is still a form of differential information transfer. However, unlike cultural change, cultural development refers to the processes associated with a society's response(s) to the rising logistical loads associated with increasing demands on production, distribution, regulation, and reproduction.

While cultural change results from constant, ongoing, situational reconstructions of attempted symbolic-behavioral expressions, cultural development represents more targeted, coordinated, and specific organizational responses to rising logistical pressures facing growing societies. The primary analytical difference between cultural change and cultural development is that cultural change occurs on top of and in some ways autonomous from the self-conscious survival strategies of government, business, education, media, healthcare, and other institutions and organizations reliant on public support and/or funding.

If populations grow (owing to, perhaps, windfall productivity, or to immigration) people will demand more, widely distributed, goods (i.e., food, housing) and services (healthcare, public safety). The effectiveness of these goods and services must then be monitored or regulated by some organization or organizations, lest public trust, health or business be lost. Symmetrically, if populations decline (due perhaps to famine, declining fertility, or to emigration), organizations in society will need to be calibrated accordingly, lest productivity overrun demand or distribution channels become circuitous and inefficient. Social systems, of any size, are expanding and contracting entities, and the degree to which the production, distribution, and regulation of goods and services optimally tracks this expansion and contraction is the degree to which energy (in the broad sense not only of food, but of the various fuels for technology, transportation and any other capacity to “do work”) is maximally available to people in that particular society.

And, to the degree that societal organizations and institutions adjust to logistical pressures, they develop in form and complexity. As I have mentioned, Spencer was probably the first to note how societies (as any system) grow in complexity as they “develop” in size. Spencer’s conceptualization of societies as cycling between more militant (hierarchical, bounded groups alongside amidst centralized, regulation-focused government) and amidst industrial (less hierarchical, more porous groups amidst more decentralized, growth-focused government) phases was perhaps the first, albeit incomplete, articulation of “cultural development” as I mean it here.

For Spencer, as organisms grow in size, their component parts *either* specialize in function in order to produce a greater range and number of resources relevant to the system’s survival, *or* the organism will not grow/will stagnate and, possibly, decline in complexity. When societies grow in size, people will tend to develop new occupational and social niches within organizations and institutions, but this differentiation then puts pressure on political, scientific, legal, medical, economic, (and, historically, religious) elites to develop policies (or myths) that help to integrate and facilitate social coordination. At any point, these processes can decay, for any number of reasons—perhaps rising inequality, perhaps government corruption, perhaps elite overproduction/credentialed inflation.

The emergence of new cultural niches, new hierarchies, new products, new services, and new forms of status is *one side* of cultural development, the differentiating side. This emergence of this complexity and novelty poses challenges for social integration and social coordination and so how societies respond to these challenges of integration represents the *other side* of cultural development, the integrative side.

If a society is to continue to grow, roads and the trade relationships that motivate them will begin to fan out in more directions and will need to be maintained and fortified. More and more water had to be canalized into the “grain core” of early cities, more and more channels for waste water had to be dug strategically, more shipping waterways needed to be carved out from the landscape, more and more ships needed to be built and so on.

These logistical pressures, as I have discussed, seem to come in roughly four forms, and each seems to be driven either by growing *population size* or by growing *population demand* for energy and other resources (i.e., educational opportunities, social status, upward mobility):

- production (some degree of organizational and institutional coordination for the purposes of acquiring enough materials to create infrastructure, commodities and services);
- distribution (some degree of organizational and institutional coordination for the purposes of ensuring the adequate and continual circulation of people and goods across space);
- regulation (some degree of organizational and institutional coordination for the purposes of developing workable/legitimate police, military, health and social services, a workable bureaucratic regulation of institutions and some national mythology/symbolization); and
- reproduction (some degree of organizational and institutional coordination for the purposes of ensuring adequate survival rates and economic opportunity for the formation of families, rearing of children and socialization of adolescents and young adults).

I could have articulated these slightly differently as I did, arbitrarily, in Figure 3.1. But the point is not how to chunk these together but, rather, what each source of logistical pressure involves. Production involves the acquisition of materials for energy and system structure, distribution involves the transportation of these materials and these sources of energy, regulation involves the normative and legalistic content of organizations and institutions, and reproduction involves the facilitation of family formation, opportunities for childcare and for economic opportunities for the young adults of each generation.

And, when I write “some degree of organizational and institutional coordination,” I mean *some*. Societies do not need to operate in some optimal, ideal, or maximally efficient fashion in order to persist and grow. This

coordination might also be unintentional, or accidental, as individual people or groups within institutions pursue their own interests only to produce unintended system-wide benefits (the classic, if simple, example of this is the shop owner who, in making the best product possible, actually benefits the entire local economy not just her own pocketbook; or, the stigmatized minority group who, in fighting for their own civil rights, secures the protection of civil rights for others).

Societies, then, experience “selection pressures,” or challenges, to adaptively respond to rising logistical loads associated with productive, distributive, regulative, and reproductive capacities. (Turner and Machalek, 2018). The faster a population expands, and/or the faster perceived needs for goods and services expands, the greater the selection pressures on these societal capacities. We can conceptualize responses to these selection pressures in the following ways:

- “Spencerian Type 1 responses,” which involve the formation of new institutions, or new organizations within institutions, that serve to develop a society’s capacity to respond to logistical loads;
- “Spencerian Type 2 responses,” which involve the formal bureaucratization of the institutions or organizations that are perceived to be most successful;
- “Durkheimian responses,” which involve competition among organizations and institutions for people’s limited time, attention and money;
- “Marxian responses,” which involve the mobilization of groups for conflict over the distribution of money, power or prestige. Those social movement organizations that can better routinize the charisma of their most popular leaders, better promote the identities of their adherents, and so on, will survive longest and stand the best chance of formally influencing law and public policy; and
- “Weberian responses,” (for these, see Abrutyn and Van Ness, 2015 and Abrutyn, Under Review) which involve individuals and sub-groups jockeying for status and influence within institutional and organizational hierarchies. This dynamic underlies each of the “Spencerian,” “Durkheimian,” and “Marxian” responses described above. For all the reasons the memeticists and cultural group selectionists have described, some ideas will tend to be more attractive than others and will therefore spread at the expense of less memorable ideas. But, also, there will be competition among individuals to absorb the cultural capital (i.e., norms, best practices, jargon, frames of reference, stocks of knowledge) of their respective organizations or institutions and to repackage this capital in a way that appears especially attractive as an entrepreneurial project.

Turner's notion of logistical loads/pressures and his reformulation and extension of Spencer's ideas are what I think best exemplify the process of cultural development. Rising population size, associated problems of population density and, especially post-1750, rapidly rising living standards and expectations put pressures on societies to develop new capacities for production, distribution, regulation and reproduction. People within societies respond to these selection pressures in some combination of the above five ways. Their responses create path dependencies—two different societies might respond to such pressures in different ways, and their different responses will limit the range of future possible choices for each society. This is the sense in which societies develop, and the sense in which each society will develop, at least to some extent, uniquely.

Unlike Spencer, Turner is clear that cultural development (in the sense described above) is not linear or inevitable. Organizations and institutions adapt to mounting logistical loads in varying ways, with varying degrees of success. Neither organisms nor societies are metaphysically “driven” by processes of internal integration and differentiation, rather, this internal growth of complexity is always contingent. This means that *if* internal structures differentiate, productive capacities can increase and the total system can grow in size, but *if* this differentiation happens to rapidly or too slowly, coordination capacities could be lost, and the system could suffer declines in resources and complexity leading, potentially to collapse. Cultural development, as with the development of bodies, consists of a series of cascading *if/then* mechanistic relationships which feedback on each other. Nothing is inevitable, and, especially regarding societies, linearity is the exception, not the rule.

If we understand societal “collapse” as a state of relative decline in institutional complexity (following Tainter, 1988), I think it would be accurate to view severe recessions, depressions, pandemics, natural disasters, civil wars and so on as contributing to mini-collapses which can snowball into larger system collapse, or, they might just stress-test existing organizational capacities for responding to logistical pressures. Like an immune system adapting to new dangers, these “mini-collapses” might, for example, strengthen laws or norms or increase efforts toward energy efficiency, disaster-response, or public health.

To borrow an apt term from Nassim Taleb (2012), societies are *anti-fragile*, meaning that the very capacity for societal complexity and coordination rests, in part, on the system being subjected to frequent, sometimes severe, challenges. Taleb uses the examples of immune systems, bones, muscles and even people, all of whom grow from being challenged and tested (within reason). Unlike ceramic vases (which are *fragile* and will break when exposed to stress) or plastic cups (which are *resilient* and will maintain form when exposed to stress), immune systems, bones, muscles, people, and social systems gain in complexity and adaptability from being challenged, tested, pushed, stressed.

Organic systems are resilient and benefit from the information gleanable from error, mistake, and needless damage.

Taleb describes his concept of “antifragile” as follows:

“Some things benefit from shocks; they thrive and grow when exposed to volatility, randomness, disorder, and stressors and love adventure, risk, and uncertainty. Yet, in spite of the ubiquity of the phenomenon, there is no word for the exact opposite of fragile. Let us call it antifragile. Antifragility is beyond resilience or robustness. The resilient resists shocks and stays the same; the antifragile gets better. This property is behind everything that has changed with time...And antifragility determines the boundary between what is living and organic (or complex), say, the human body, and what is inert, say, a physical object like the stapler on your desk,”

(Taleb, 2012, pp. 3–4)

I should also point out that anti-fragile (organic) systems have a tell-tale sign of health: a capacity to accommodate wide fluctuations in production, reproduction, distribution, and regulation (Levy, 2017). Consider the strongest, healthiest person you know. Now, consider the weakest, least healthy person you know. Which of the two can accommodate a wider range of heart rate, a wider range of physical movement, a wider range of blood pressures and so on? The healthy person is “healthy” in part because the structure of their system can accommodate a widely fluctuating output, as when they wake up with a heart rate of perhaps 70 beats per minute but, by midday, they are jogging at 140 beats per minute, before going to a dinner party that evening and drinking and socializing at about 85 beats per minute, and eventually winding down later that night with a heart rate of 60 beats per minute.

Though perhaps paradoxical, healthy organic systems can accommodate (and to Taleb’s point *adaptively gain information from*) high levels of disorder and fluctuation. In the case of the jogger above, their muscle fibers and bone strength will benefit from the impact stress of jogging and the fluctuation of the heart rate will facilitate healthy cell development in the lungs and heart. In the case of a society, economic depressions, natural disasters, or civil wars might, again quite paradoxically, lead to the strengthening of the social systems’ institutional norms, political governance, infrastructural maintenance and so on.

In sum, cultural development involves the particular paths organizations and institutions in society take as they develop (or do not develop, or partly develop) new productive, distributive, regulative, and reproductive capacities in response to the population’s (in particular, elites’) perception of the severity of logistical pressures. Within a single society’s lifespan (thus far, somewhere in the neighborhood of 100–400 years), much

development, that is, much attempted organizational and institutional responding to logistical pressures, will occur.

8.1.2.3 Cultural Evolution

As I am using these terms, “cultural development” is different from “cultural change” in that (1) cultural change is a constant and ongoing proliferation of some ideas, and associated behaviors, over others, while (2) cultural development is a relatively slower, more intentional, coordinated, and directed response to the perception of mounting logistical pressures.

Cultural change and cultural development occur within and also between societies. Cultural evolution, however, is something that only happens to societies as a collective of entities. It is a deep-historical process that does not work on this or that human society but on *human societies*. That is, it occurs on a timescale longer than both cultural change and cultural development. On my conceptualization, it is not *any one* society that evolves. Societies *develop*; ideas *change*. What “evolves” are the infrastructural units of societies. Cultural evolution is what results when the gradual storing and differential retention of engineering principles in communication technologies (with the first such human communication storage technology being the brain's neocortex) leads to the accumulation of material modifications and adaptations to infrastructural systems *across* societies.

Perhaps a more delineated definition will be helpful: “cultural evolution,” is the (1) differential storage/retention of engineering principles/equations which (2) code for the production of material units of infrastructure with (3) this process, over time, potentially changing the capacity and/or output of infrastructural systems or their constituent components. Evolutionary processes occur in human societies because, and only because, (1a) information pertaining to energy extraction, processing and distribution is continuously (although not necessarily consistently) created and modified across the expanse of human history, (1b) only some

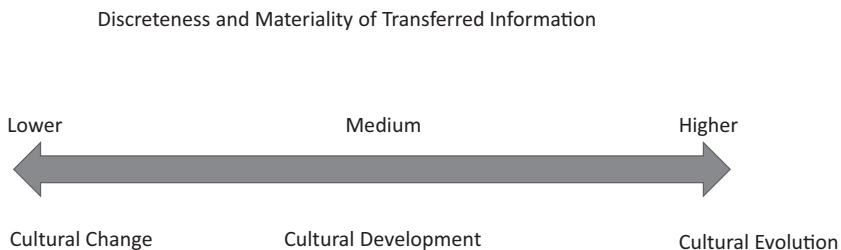


Figure 8.1 Continuum of Structure in Transferred Information

subset of this information is selectively stored in communication technologies, leading over time to (3) structural changes in the capacity or outputs of infrastructural systems.

Units of infrastructure that appear best able to extract, process, and distribute relevant resources—fuel, food, water, material for shelter—will proliferate differentially because the principal information necessary for their construction will be selectively retained. The first communication technology in which infrastructural engineering principles were stored was the human brain. This is where the first principles of fire-making or well-digging and water-pumping, were stored. Subsequently, the information necessary to engineer infrastructural units has been stored in the written word (from pictograms to alphabets), then in audio/video recordings and now digitally on computer hard drives.

Cultural evolution is not only, or even centrally, about people, groups or ideas; rather, it is about the differential retention of engineering principles relevant to material changes in infrastructural units. Cultural evolution is not the flashiest or most interesting part of culture—cultural *change* and *development* have long occupied most historians, archaeologists, and social scientists. Although memeticists, anthropologists, economists, and sociologists will often talk about “cultural evolution” they are really talking about cultural change, or cultural development. In fact, cultural evolution, as I am conceptualizing it, is virtually never studied by anyone! Although I have a PhD in sociology, I was never required to take any civil or structural engineering courses or history of engineering courses. In fact, I have met few sociologists who think a society’s infrastructure is more interesting than its art, music, religion, politics, group competitions or wars. It probably is not.

But, nevertheless, material infrastructural systems and their components are the “units of evolution” acquiring modifications and adaptations. And the differential retention of specific information related to infrastructural engineering (mathematical equations, models or diagrams) are the “units of selection.”

In Dawkins’ (1976) framework, building on the work of his mentor Nikolaas Tinbergen, the gene, a discrete unit of nucleic acid, was the only materially well-defined entity in animal societies that revealed both variation and amenability to selection. This has been a persistently influential framework and it underlies the many influential critiques of group selection. Indeed, after a lecture Robert Trivers gave in the Fall of 2017 at Chapman University in Southern California, I asked him what role norms (i.e., community held assumptions or habits) might play in cultural evolution to which Trivers replied something to the effect of “And what the hell is a ‘norm’? If you are just referring to regularities in behavior, yes, that can already easily be accounted for in existing gene-frequency models.”

So, the issue boils down to whether (1) the only clearly defined material units, revealing variant properties and subject to varying levels of reproduction/retention are genes, and therefore “group selection” is nothing more than shifts in gene frequencies accountable to shared patterns of behaviour; or (2) whether human societies contain their own, emergent, clearly defined material units, revealing variant properties and subject to varying levels of reproduction/retention. Orthodox evolutionary biologists reject the latter possibility because, they ask, what the hell is this supposedly emergent, clearly defined, material unit that drives evolution at the human societal level?

How, the evolutionary biologists ask, can groups or ideas or values or organizations or institutions or norms be proper “units of selection”? These things are neither discrete nor material and they are not inextricably connected to any stable, discrete and material entities. Where does a group start? Where does it end? What material structures are inevitably tied to groups? Where does this “groupishness” or “idea-ness” or “value-ness” or “institution-ness” exist in a material form that can be subject to measurable changes in frequency over time?

Genes are (relatively) discrete units. Groups, ideas, values, organizations, institutions and norms are not (or are not always). Evolutionary biologists will concede that groups, organizations, institutions, norms and so on change in form over time and that, for example, individuals who are members of groups that are unusually cohesive or otherwise conducive to individual flourishing might transmit more copies of their genes, on average, into the next generation. But this would just be natural selection operating on genes, albeit doing so in a modified way because aggregate group behaviors, instead of independent individual decision-making, is influencing survival and mating opportunities. But, for an orthodox evolutionary biologist, this would not be selection at the group level, it would, rather, be modeling various changes in group behavior and the effects of this changing group behavior on the likelihood of any one group member’s genes making it into the next generation.

The debate over what might constitute a “unit of selection” at the societal level has been why some of the most prominent social scientists (to say nothing of evolutionary biologists) have been, and still are, hesitant about the notion of cultural evolution. Are “norms” an emergent, societal-level unit of selection? If so, the same set of questions apply: What is the discrete material entity reliably associated with the existence of a norm? Where does a norm begin and where does it end? Don’t norms ultimately exist inside of peoples’ heads, and therefore are they not ontologically subjective (Searle, 2010), as opposed to discrete material units like genes? After all, genes do not just exist in our thoughts, and this is what makes them uniquely reproduceable/retainable over time.

The same goes for the concept of a “meme” as it does for the concept of “idea.” Where does an idea begin and end? Are ideas stably associated with material entities or are they only sometimes, and erratically, so associated? Are ideas discrete or do they blend into other ideas to form ideologies and worldviews? Yes, ideas are material in that they relate to specific, patterned, neural firings in our brains, but are the material neural firings, themselves, being directly reproduced or retained by societies? Memeticists would insist that memes contain core elements of discrete information, but just what these core elements precisely are, we are not told. It seems, if we take groups, norms or ideas to be units of selection at the societal level, we are continuously vulnerable to the discreteness critique or the materialist critique.

‘We are faced with the same lingering question over and over: which ideas generated by human groups are the most discrete and symbolically consistent intergenerationally? Which ideas are most reliably tied to the creation of material structures intergenerationally? I contend that engineering information and infrastructural units satisfy these criteria best. Stored engineering equations and diagrams are the clearest analogue to units of selection, and associated material infrastructural units acquiring modifications are the clearest analogue to units of evolution, at the cultural level.

Like biological organisms, societies are composed of emergent energy-enhancing structures that we call “cities.” These cities, along with other population hubs within a society, contribute to a society’s metabolism, or in other words, its ability extract, transform and distribute energy throughout the system. One might object that cities (and other populous hubs in societies) are not organisms because they are composed of individual humans who are themselves the relevant organisms. However, this reasoning would be a mistake, as it ignores the various ways in which organisms often coordinate collectively to create super-organisms.

A great example, if one is tired of the references to honeybee hives or ant colonies, is that of the Portuguese man o’ war, which is not a single multicellular organism (although it behaves as a single organism), but is, rather, a colony of specialized organisms of the same species. This jellyfish functions as though it were a single animal, but it is in fact fully comprised of multicellular organisms. Analogously, cities “act” in singular ways (e.g., Mayors make decisions that change policy city wide), while being, in fact, entirely composed of multi-cellular organisms (people). And, yes, the same might be said for beehives or ant hills that act in a collective fashion while being entirely composed of independent multicellular organisms.

The metabolic rate of cities is, in turn, a result of the extractive and distributive capacities of what West (2017) calls “terminal units,” of infrastructure. or the most fundamental infrastructural units of energy

production, processing or transfer in a society. Terminal units in our modern societies are things like gas lines, water lines or power lines. Fascinatingly, terminal units are indeed discrete and invariant, as West (2017) has shown. Unlike ideas, organizations or institutions, power lines or electrical outlets or faucets today look roughly similar, regardless of the society one is in, and it is not hard to determine where a power line (or network of lines) begins and ends.

Terminal units of infrastructure are analogous to the terminal units of biological organisms, such as mitochondria within cells or different types of cells in bodies, all of which have the same basic structure from person to person (or from cell to cell). Mitochondria are also discrete and material, as are, for example, power plants (which also look roughly similar, depending on the type, everywhere in the world). The invariant structure of terminal units is due to uniform pressures for efficiency, scope, and accessibility within a growing energy-producing system existing in a circumscribed design space.

Undersea internet cables, for another example, look pretty much the same wherever they are found because there are only so many ways of efficiently transmitting electrical signals underwater. In other words, the design space for creating a material structure capable of transmitting large amounts of electricity underwater is not infinite. Should there be an engineering innovation in undersea cable construction that is perceived to increase internet efficiency, scope, and/or accessibility, the likelihood that the associated engineering principles will be stored in (today, digital) databases grows, making them more accessible across generations, thus (in principle) enabling a greater degree of energy to be created and distributed (via the internet) across societies.

West's (2017) work shows that terminal units scale sub-linearly with population size. This means that, in any given large system, there are fewer terminal units per capita than would be expected given linear population increases. So, for example, there are about 15% fewer gas stations and electrical lines in Tokyo than would be expected if we assumed linear increases in gas stations given the number of people. This is, in part, because cities are dense and compact, meaning that any one gas station or electrical line, if built efficiently, can serve a larger number of people. But this is also because, if gas stations or electrical lines *do not* become more efficient and/or easily accessible, the surrounding population would not have access to the available energy to grow in size or in complexity.

Fascinatingly, it is also the case that some cultural indicators (e.g., college degrees attainment rate, patent filing rate, crime rate, business licensing rates) seem to scale *super-linearly*, meaning that, around the globe, there are about 15% more restaurants, crimes, and college degrees than would be expected based on linear increases in population size. In short, if a system is to grow, its terminal units of infrastructure (and associated

infrastructural systems) must be continually resourced, refined, innovated and made more efficient. If terminal units of infrastructure become more efficient and accessible, proportionally fewer are needed as populations grow. However, at the same time, the more a system grows in size and complexity, the greater the number of potential interactions between individuals leading to a super-exponential growth in symbolic and behavioral complexity (from college degree rates to crime rates to rates of art museum openings)

How terminal units of infrastructure are created, disseminated and institutionalized will influence how a society *develops*. For example, Spencerian (type 1 and 2), Durkheimian, and Weberian selection bear on whether terminal units are developed, innovated, and maintained, while Marxian selection occurs when terminal units are refined slowly, or inadequately, such that people in a society perceives themselves to be deprived of the sources of energy, or associated social services (such as schools which rely on infrastructures like electrical systems or irrigation systems), required to sustain their lives and to flourish.

So, while Spencerian, Durkheimian, Weberian, and Marxian selection are acting to greater or lesser degrees on each organization and institution in a society, the “unit of evolution,” is the humble infrastructural system, whose profane extraction, refining and distribution of energy is the final, discrete, material arbiter of whether inter-societal systems will grow in number or complexity.

To restate: the *units of evolution* in human societies are the primary infrastructural units—like gas pipelines and their stations, electrical cables and their stations, or sewage pipes and their treatment plants (to use historically recent examples)—most proximate to energy extraction, processing and distribution. Infrastructural units are prior to, and more fundamental than, organizations that enable human flourishing such as grocery stores or pharmacies or art museums or schools.

To restate: the *units of selection* are the most simplistic, most discrete, engineering principles (i.e., mathematical equations, principles, models, diagrams, and basic written or verbal descriptions) which have been differentially retained in communication technologies across the eons. Cultural evolution is not so much about what this or that society does or does not do. Cultural evolution is, rather, what human societies—in their totality—have been doing, from the earliest memories of our ancestors who sought the best means of making a fire for cooking or heating to the most sophisticated modern computers housing current, and no doubt debated, principles of engineering and construction related to water treatment systems, refineries, gas lines, electrical grids, roadways, bridges, and any other structures most proximate to the extraction, processing, or distribution of energy within and between societies.

Everything related to our flourishing—schools, grocery stores, hospitals, libraries, community centers, fire departments, businesses—rests on terminal units of infrastructure and configurations of these units into infrastructural systems. These are the most proximate physical mechanisms keeping the lights on, the water flowing, the room heated, and the food refrigerated. The more these luxuries can be accomplished at scale, and cheaply, the more schools, hospitals, grocery stores, art museums, and theaters can proliferate, creating their own new contexts for ever more infrastructural innovation and cultural complexity.

8.1.3 Coda: Societal Collapse as a Refining, Infrastructural-Evolutionary, Process

I have tried to emphasize throughout this book that “collapses” of organizations, institutions or of entire societies almost never involves what our intuitions would expect, some kind of sudden and panicked scattering of people in all directions. Certainly, such collapses can (and do) happen, but most of the time, collapses involve subtle reductions in institutional complexity that might take place over decades if not centuries (Tainter, 1988; Cline, 2014; Smith, 2019).

In very rich societies, with large classes of economic, political, religious and intellectual elites, virtual-signaling assertions about the sordidness of each other and of their country could hasten this ruin; like the spoiled child convinced that they hate their parents and that they would like to burn the house down, elites frustrated with their lack of adulation might wish their society to crumble. This is why, throughout history, many large-scale collapses appear to be accompanied by both reductions in complexity and an out-of-touch, narcissistic, elite class more focused on their own personal status and power than on the mounting logistical pressures bearing down on the people in their societies.

I must make it clear that societal collapse in any serious sense is not inevitable, no matter how sour relations between individuals becomes. My suspicion is that, perhaps especially in more materially comfortable and technologically sophisticated societies, politics and religion serve much the same purpose as theater, with people insisting on revolution and on the awfulness of their adversaries while, in fact, contentedly turning to their favorite TV shows or hobbies once they’ve grown tired of social media for the night. After all, societies do not require extremely high levels of affiliative cohesion—really, for the most part day-to-day, what matters is whether people enjoy a widespread instrumental capacity to get work done and services rendered. A sense of national togetherness is great, but people are not going to flee to the countryside and abandon their life of (relative) luxury just because someone acted like a jerk today in Congress. A lot of social media and family bickering can go on without posing a risk to the

primary infrastructures that keep society humming along. Revolution, after all, takes effort, and couches are only getting more comfortable, and refrigerators better stocked.

Societal collapses are only rarely endings. Instead of seeing societal collapses as endings, we might see them as continuances of a different sort. Sometimes, a library of Alexandria is burnt, but it is rarely burnt entirely, and copies of some works persist. Even the most devastating collapse is, typically, a continuance by other means, a slowing down of cumulative complexity more than a snuffing out. Most importantly, often, by the time a rich and successful society “collapses,” it has produced much wealth and literature and engineering advancement to the wider globe.

Maybe, even, collapses are a component of the fission-fusion process which has been taking place across societies especially over the last 10,000–12,000 years. James Scott (2017), in his review of the emergence of ancient cities, appears to make a similar case. Scott argues that people in ancient cities would often “fission” (my term) away from the urban “grain core” (Scott’s term, denoting the production center of cities) into the countryside. Why? Why would people periodically pick up their belongings and take off? Certainly, this must have been quite disruptive to people’s lives. Yet, there were many good reasons to do so, for example, (1) to avoid labor or grain taxes; (2) to escape an epidemic; (3) to escape oppressive serfdom or political persecution; or (4) to avoid death in combat in civil or foreign wars (Scott, 2017). To this list, we can surely add other reasons why people might flee cities and nations—pollution, population density, cost of living, shrinking markets, and so on.

But Scott’s point is that the very origins of cities, and we must assume of societies themselves, contained this breaking apart and, ultimately, coming back together. We break apart when we are underserved by our collective obligations, or when maintaining co-presence brings greater threats to life or opportunity than dispersion; but people also inevitably, relentlessly, reaggregate because collectives are more effective resource extractors, builders and helpers than are individuals and, besides, superordinate group identities feel good to develop, validate, and express.

As I said above, societies, and the cities they contain, are anti-fragile (Taleb, 2012). They can grow in sophistication and disorder over time despite, indeed *because of*, massive shocks to the system. Instead of thinking of societies in their distinctness—society A, society B, society C, and so on—try to think of human societies as a taxonomic group of colonies created by a single species. These things, these “societies” and “cities,” have been popping up around the globe for many thousands of years. Every great empire that has ever existed has fallen, yes, but each was also an earnest experiment in human organization, and its fall a genuine warning to others. Despite their various reasons for declining, each empire’s successes and failures did not go unnoticed by peasants and elites alike.

Societies, as societies, gain from disorder because the people building them or interacting with them learn from experience, from narrative, from scholarship. Society A, B, C... etc. have collapsed and will collapse, but *societies* continue on just a bit wiser.

Cities and their societies become more antifragile the more complex they become. It would seem to us moderns that our societies are so complex and intricate that, surely, they must be fragile, they must be teetering on a knife's edge. But our intuitions betray us again. Societal complexity—be it in the division of labor, in family arrangements, in educational options or in consumer choice—is an interlocking fabric with a tensile strength that can increasingly resist easy tearing.

Monica Smith (2019, pp. 255–256, 258) notices this adaptability emerging in ancient societies, a trend that is truer today than at any time in human history. I will quote her at length:

“...urban centers are remarkably sustainable despite their apparent vulnerabilities. Cities are able to withstand occasional shortfalls and periodic warfare because of transportation networks that bring goods in from all over...there were many ways by which any particular city could be supplied with food, people, and raw materials...When catastrophe struck—a prolonged drought, a flood that wiped out one set of fields, or a war in a distant region—city dwellers hardly felt the pinch because some other supply zone could always fill the breach... In ancient times, while there are plenty of examples of individual cities that lost their populations and became abandoned, there are almost no cases of overall regional collapse...ancient cities didn't really collapse [but] simply morphed into other forms or sent their populations scurrying to the shelter of another metropolis...”

If collapses are not generally apocalyptic but rather occur slowly over time, and result in varying degrees of reduced complexity and out-group/out-society blending, what (other than a general failure to respond adequately to logistical pressures) tends to cause them?

Well, we can answer this question in one of two ways. On the one hand, we can talk about the economic, political or ecological antecedents of collapse, but these antecedent causes are so numerous, and interact in such idiosyncratic ways in any given society, that I will lead us too far afield discussing them in any detail. Besides, other social scientists, archaeologists and historians have engaged this topic better than I could, and Tainter's (1988) masterpiece remains instructive for those looking for an incisive overview. By way of summary, it seems that political corruption (elite overproduction and elite in-fighting), geopolitical strain (either owing to a country attempting to defend too many homefronts, or maintain too many foreign occupations), rapidly rising populations,

demographic conflict (as over immigration), price inflation, and sharply rising taxation are all common characteristics of collapsing societies (Skocpol, 1979; Goldstone, 1991; Collins, 1995).

It is also fairly easy to recognize a serious societal crisis, once a certain threshold of mini-reductions in complexity begins to threaten the administration of national affairs. During a serious societal crisis, police departments, fire departments, and hospitals (or their ancient equivalents) cease functioning, markets for various basic goods drop sharply in value, rates of disease and violence rise sharply. The final death blow to a society is to destroy its infrastructure; this is the source of energy driving all of the above. An attack on infrastructure could be sudden, or infrastructural breakdown could occur more slowly, as when malfunctions, erosion/corrosion and age wear down productivity or accessibility. But to the degree that the extraction, processing or distribution of energy are reduced, political and economic elites will become increasingly constrained in their available responses to subsequent logistical pressures.

Another way to assess the likelihood of collapse and/or major revolution is to think about the conditions under which mounting logistical pressures are least likely to be addressed by institutional elites.

Jared Diamond (2011) has reviewed the societal collapses of the Anasazi (in the US Southwest), Maya (Yucatan Peninsula), Easter Island (in the Pacific), Angkor War (Southeast Asia), Great Zimbabwe (Africa), ancient Mesopotamian societies of the Fertile Crescent, Rome, and the Harappan (Indus Valley). In each case, collapse was caused by what Diamond calls “failure of group decision making” to manage/allocate resources effectively or efficiently. Diamond (2011) identifies 11 risk factors for collapse, which I have organized into four sets of scenarios:

[Set One] Institutional elites might not anticipate a problem before it arrives, owing to (1) lack of past experience or (2) forgotten prior experience.

[Set Two] When the problem arrives, elites might fail to perceive the problem, owing to (3) the origins of the problem being unknown, (4) problems emerging slowly and fluctuating, or (5) decision-makers being distracted from the problem.

[Set Three] Institutional elites might perceive the problem, but might not try to solve it, owing to (6) some people benefitting from the problem’s existence, (7) solutions appearing too costly, (8) the problem appearing remote/non-immediate.

[Set Four] Institutional elites might perceive the problem, and try to solve it, but fail, owing to: (9) the problem being too complex, (10) solutions being too small in scope, or (11) too late in the growth of the problem.

Yet, what the concept of societal collapse really teaches us is that complete fissioning is extremely rare, if it has ever happened at all—when the

human colony begins collapsing in on itself, social groupings remain, just in temporarily smaller, less interconnected form. Reaggregation, perhaps elsewhere and perhaps in somewhat different form, is certain. This is an antifragile system, resilient to complete dissolution, and containing component parts—people—who are to varying degrees motivated to absorb information regarding the reasons for declining complexity in order to avoid it in the future.

In the future, as in the past, the most serious threats will be to infrastructure. Climate change, as just one example, will influence, in difficult-to-predict ways, the corrosion and erosion rates of core infrastructural units like pipes, wires, chips, or motors, and thus the energy-bearing systems that rely on them. This is not a minor concern—there is an extensive set of interlocking infrastructural networks characterizing any given society, and when maintenance, renovation or innovation is required this is an enormous fiscal and social undertaking. Yet, everything depends on it.

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Chapter I

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