Culture: How to Make It Work in a World of Hybrids

(Draft circulated for comments)

Chapter One: Culture

Michael Agar magar@umd.edu

Recently the time horizon became visible – a story for another day –so I decided that I better work on something I really care about and work on it fast. My past projects have been called any number of things, some of them unprintable, but at their heart they always have something to do with language and culture. It goes back to my time as a high school exchange student in a small town in Austria. I had never studied German. I gave up on getting by in the local school – the classes at my age level were more sophisticated than my US high school. I couldn't have done them in English. But I did live with a family and make friends and within those small social circles I learned enough to get by. It turns out that a particular family or a small group of friends tend to talk about the same things over and over again, so I got pretty good at it.

I only became a language and culture junkie when I registered for German class as a university freshman after I returned home. The department requested an evaluation. They didn't know what to do with me. I was more comfortable using the language than some advanced graduate students, but I was only fluent in the role of obnoxious teenager. The Prussian professor disliked me. I had never heard of Goethe and I spoke in upper Austrian dialect. Language and culture were pretty interesting things, I decided, since the professor and I

were supposedly speaking the "same language." I was doomed from that point forward to become a linguistic anthropologist who considered language and culture a problem that you had to deal with in different ways in different contexts.

Since then, I've done language–culture type work as a researcher, as an applied problem solver, and as a practitioner. Several examples from this long history will appear in the book as time goes on. But, in this book, I'm after a fundamental question. Language and culture are considered the foundation stone for the emergence of modern humans like you and me. Something to celebrate, no? But then why nowadays does it seem like those amazing abilities are often linked with conflict? Did we just stop evolving? Is there something in the early story that might explain what went wrong and how to fix it? Is it that we created a world where the old evolutionary gift of culture has turned maladaptive if not terminally dysfunctional?

"Culture" will get most of the air time in this chapter. "Language" will come to center stage in the next chapter. Most scholars in the field recognize that language and culture appeared at more or less the same time in the story of human evolution. But researchers usually focus on one or the other, not on both. The culture mavens focus on things like beliefs, values, and practices of the new Homo sapiens. The language mavens stick more to the details of sound and grammar. I tried to fix this problem in a book in the 1990s with an awkward concept called "languaculture." We'll return to that concept in a later chapter as well, once we get more language on the table.

In this section and the next I'll by and large follow the contours of this false dichotomy between language and culture, focusing on culture in this chapter and language in the next.

Then we'll put the two together and get on with that fundamental question of why the concept of “culture” has become dysfunctional in the world today.

Embrace Vague and Ambiguous All Ye Who Enter Here

I can summarize the starting point for this section with: "Culture" is a frequently used mess of a concept with more meanings than there are cars on the LA freeways. It usually travels in partnership with a "problem" in today's discourse, unless you're an anthropologist, in which case it's a word you try to avoid because it's not clear what it means anymore. Culture is “an ordinary word,” as Groucho used to say on his old TV show *You Bet Your Life*, “something you use every day." He always picked a "secret word" for each show, and, if contestants said it, a duck fell from the ceiling and they won a hundred dollars. The way "culture" is used nowadays, it would be raining ducks if Groucho was in charge.

Culture is now promiscuously used to pretend that a problem has been described or explained when in fact it has only been squashed with a label like an insect with a flyswatter. At the same time, anthropologists—the culture professionals—routinely throw up their hands, if not their lunch, trying to make sense of what the concept might mean in our globally-connected post-structural, post-colonial, post-everything world.

In this day and age, saying "culture" is like going into Las Chivas, my neighborhood coffee shop, and saying you’d like a "cup of coffee." Coffee has so many meanings now, on the one hand, and on the other, most of the old meanings just plain don’t work anymore. Odds are good that the waitperson, I mean the barista, will *not* answer the question with “cream or

sugar?" He'll say, "What kind of coffee?" and, if he is kind, he'll help you along until you got to what you wanted, a half-decaf half-skim double tall cappuccino on the dry side with a shot of amaretto.

The fact that "culture" has so many meanings can be verified with a week's worth of reading of popular media. You might read, just to offer a few examples, about the *culture* of gangs, the *culture* of IBM, the *culture* of Iraq, and the *culture* of Northern New Mexico. None of those uses of culture will tell you much, if anything at all, about gangs, IBM, Iraq, or Northern New Mexico. In fact, they will conceal most of what a reader might want to know if they were really interested.

In that list of examples, culture labels a loosely defined set, a collection of people who have just one attribute in common, that attribute being whatever comes after the word *of* in the phrase *culture of X*. After the labeling, we believe we know more about the labeled group than we did before. By naming it as a culture we think we have described or explained something, a mistake rooted in the old traditional use of the concept. We think we understand a lot about the labeled group but actually most of our prior stereotypes will survive unblemished under a new name.

From an insider's point of view, the concept can also serve political-rhetorical purposes. In management jargon, culture often means what I think our business *should* become. As another example, consider the culture of Northern New Mexico, the place I call home. It is complicated social territory, a place where a large number of histories intersect within a comparatively small population--different waves of Native Americans, Hispanics and Anglos over the centuries, each of those labels in turn lumping together many significantly different

groups, each of those groups in turn having histories of blending and intermarriage as well as separation. One often hears culture used to represent the political and economic interests of a real or imagined constituency. Culture can become a legal concept, a rallying point, a bargaining tool, or a commodity, or all four plus something else.

The traditional academic use of the culture concept isn't in much better shape. In the old days, anthropologists used it as a comprehensive and coherent label for a small-scale society and everyone in it. The Navajo, to take another New Mexico example, were called a culture. Wait a minute. Not so fast.

Say a hypothetical anthropologist lived with the Navajo for a year or two, although in this case the name Navajo covers a lot of territory, including several states, and has a fairly sizable population of about 175,000 people on 26,000 square miles of reservation, and that doesn't include Navajo living elsewhere. So right away we've got the problem an older Chicano student had when I taught in Texas. He came to the office to ask a question. "You know this book you assigned, *The Mexican-Americans of South Texas*?" he asked. "Yes," I said. "Well, the title should say *some*."

That little problem is just the tip of the iceberg. Anthropology used culture as a label that covered all of what a person was. The concept explained and generalized people as members of a particular culture, and only of that culture. Everything the anthropologist saw and heard and learned was part of Navajo culture, to stay with that hypothetical example.

A few years ago I went to the reservation for the first time, as a hiker/tourist, not as an anthropologist. I noticed in the supermarket that by appearance alone there were dozens of different kinds of Navajo, everything from blue spiked hair to red velvet skirts. Then I overheard

a conversation where one Navajo talked about others in terms of whether or not they were "traditional." The evaluation ran from yes or no to several points in between. Then a young woman told me that the real badge of identity was a personal connection through kin to the Long Walk, when the U.S. relocated the tribe in the 19th century to what was in fact a concentration camp. She didn't mention language or clan, which is what I'd expected to hear. She reminded me more of exile and return and holocaust conversations I'd had with Israelis than of anything I'd read about the Navajo.

This superficial vignette is enough for the moral of the story. Everyone now, Navajo or anyone else, is a mix of cultures of many different sorts, and the mix can vary from one situation to another, and the person can vary in their attitude towards different parts of the mix, and any particular culture in the mix is probably debated and changing from the point of view of its members. An African-American call-in radio show in Baltimore, for example, fascinated me, an old white guy working in that city. I listened to callers debate, day after day, what it meant to be black. It meant something to everyone; but exactly what it meant varied all over the place.

The old image of culture fired the anthropological imagination for decades. Not so long ago, professors of anthropology were still hunting for the last primitive culture. Some readers may have read about the madness around the discovery of the so-called Gentle Tasaday in the Philippines in the early 1970s. Anthropologists, and many others, wanted to believe that a genuine *primitive* culture still existed in the modern world. The discovery was followed by accusations of fraud, that a local rich guy paid some indigenous people to imitate an

undiscovered isolated tribe. A more recent book tells the convoluted and controversial story (Hemley, 2003).

In the 1990s I was lucky enough to have a chance to chat with a justice of the supreme court in Palau. The island nation had achieved independence from the United States in 1992. I was visiting the country as a tourist/diver, but a Palauan colleague in public health had invited me to a few social events. When the justice learned I was an anthropologist, he told me a story about the late William Gladwin, an anthropologist who had done fieldwork for years in Micronesia, a man whose personal integrity and scholarly work was, and is, among the most admired in the field. He had helped out as an unpaid consultant, at Palau's invitation, to make the transition from United Nations' protectorate under U.S. administration to a "compact of free association." The justice's affection for Gladwin was obvious. But, he said, the anthropologist was too biased towards traditional culture when it came to drafting the new constitution. The island, said the justice, had to acknowledge it, but they couldn't build a late twentieth-century nation on the basis of ancestral custom.

In anthropology it is not news that the old culture concept doesn't work anymore. The old concept carries connotations of a closed system, frozen in time, with a comprehensive and consistent image of what a person is and how he/she should act. No more. Nowadays the term of art is "globalization," as it is in many other popular and professional conversations and writings around the world. And globalization means we have to rethink the old idea of culture when we talk about a particular person or a particular group. A person nowadays isn't just wrapped in a single culture. A person nowadays is wrapped in … what?

The Palauan justice's argument is also the argument of this book. Culture has become part of the problem, not part of the solution. Now cultures are loose cannons, or was that canons, of many calibers in the social fields of our global world. This mixing and matching and resulting conflict among what we think of as cultures has acquired some different names. One, made popular in the work of Nestor Garcia Canlini, is the word *hybrid* (2005). Hybrid has some meanings that others object to. In fact, some people prefer words like "creole" (Hannerz, 1993), on the analogy with creole languages that formed from blends of a local and a colonial language.

For my purposes here, I'll stick with the term hybrid, with one modification on the dictionary definition: "A thing made by combining two different elements; a mixture." The modification is, there can be many more than just two elements in the mix. Take me, for instance. I'm of a generational culture, a sixties college student, early baby-boomer, retirement age. I'm of Chicago Irish ancestry on my father's side, unknown on my mother's, but the Irish part was never emphasized growing up, and one great-grandfather started out Protestant in Ireland. A recent DNA test says I'm 27% Ashkenazi, something of surprise to a former altar boy. I'm a recovering Catholic who went to Catholic grammar school. I've lived and worked in Austria so much over the years that I'm part Austrian in a weird way. I've worked in the streets with heroin addicts. I've been a scuba-diver for decades. I'm an old white guy. Santa Fe, where I live now, is the first place I've ever lived where "whacky old white guy" is a recognized ethnic group.

As an old friend of mine used to joke, but enough about *me*, how do *you* like my new hairdo? The above list of labels used as cultural tags has only just begun. There are many, many more. All of those "culture" categories are labels someone might use to explain things I do or

say. More than one will be relevant to any moment of explanation. To make things worse, the way any number of them mixes with the other will vary from time to time. Worse still, my relationship to any of those labels changes over time and will continue to do so. Worst of all, I regularly meet people, also members of one or more of the categories I belong in, with whom I have little in common, sometimes to the point where membership in the same category makes no sense.

I'm a multiple *cultural hybrid*. So is any reader of this book. I'd bet a large amount of money that the members of the Gentle Tasaday, the "primitive" tribe mentioned earlier, are too, certainly by now in the early 21st century. As one reviewer of the book about them mentioned earlier put it, they have become "professional primitives." Among many other things.

So we are struck with problems—often called "cultural" but also problems of "diversity" or "social exclusion" or any number of other ways of putting it—that are the results of our human world changing from isolated groups of hunter–gatherers to a global society. And the same changes that knit the world into a global society—war, trade, neoliberalism, migration, technology—have made the culture concept difficult to use to solve the problems these historical forces have produced. The culture concept doesn't apply in a straightforward and coherent way to hybrids that recent global history has bred in increasing number.

The problem is that we can't use a concept that doesn't work with hybrids to fix a "culture" problem. To cite a famous Einstein quote, "We can't solve problems by using the same kind of thinking we used when we created them." The book returns to hybrids in a big

way later, especially in the last two chapters. First, though, we need to do some more work on the culture concept to learn more about what we're dealing with.

Diversity You Say?

I'm an anthropologist, so when it comes to human variation in beliefs or practices I automatically think "culture." But most people are not anthropologists, fortunately for the world, and when they think of human variation they use words in addition to "culture" to mean more or less the same thing.

https://www.google.com/search?q=organizational+diversity&client=safari&rls=en&source=lnms&tbm=isch&sa=X&ved=0ahUKEwib28q1tsTPAhUBeD4KHajVAv4Q_AUICSgC&biw=1136&bih=570#imgrc=Jqf35EwJxVdZHM%3A

For example, many in the real world talk more about human variation in terms of "diversity" instead of culture, another cliché of our day. Above is a picture of the diversity dream from a business perspective, a group of smiling young people affirming their unity, like an NFL team right before the kickoff, only with more simpático expressions on their faces. Three men and three women, one person from each gender white, the other two persons of each gender of color, though a different color from each other, all done with politically correct algorithmic precision. Research, claim the organization theory types, shows that diverse teams will be more creative and make better decisions when compared with—I don't know what to call them, the non-diverse, the uni-verse?

This might be right under certain conditions and terribly wrong under others. I remember working in Baltimore, a majority African–American city. I worked with a group where most colleagues were black. The United States—recent events around police shootings have made the headlines—is a racially charged nation, a long-standing fact obvious to most everyone. It took a couple of months for everybody in the project to get past suspicion and caution and eventually land in trust. The key seemed to be getting to where, if someone said something insulting or just plain stupid, everyone assumed it wasn't malicious and treated it with humor. The change was about the development of reputation and trust, a theme we will return to. Once we got to that point, we did get very creative. Different perspectives provided many more ingredients for a solution to whatever problem we were dealing with than any single perspective alone could have.

Diversity isn't the only alternative name for culture–like issues. Some Europeans talk more in terms of inclusion and exclusion. See http://www.inclusionexclusion.nl/site/ for an example. Elsewhere the phrase "identity politics" has become cultivated territory, meaning the organization of a political movement to struggle against injustice on the part of some category of person. The online *Stanford Encyclopedia of Philosophy* will enlighten you on its history and current shapes at http://plato.stanford.edu/entries/identity-politics.

I hope to convince you that a rose by any other name would smell as sweet, to steal a line from Shakespeare. This book is about culture, among other things, but it is more general than that. It is about anything in our contemporary terminological jungle that names conflict arising from human variation.

All of these perspectives—and many others—see culture, or diversity, or inclusion/exclusion, as an *issue,* a problem*,* a new characteristic of modern life that needs to be recognized, understood, and dealt with. In the spirit of "inclusion," I will continue to use the term "diversity," just in this section, to show you what I mean. Whenever you see diversity, you should be able to substitute cultural differences, as far as popular discourse goes.

But why is diversity a problem? Haven't different kinds of people gotten along in the past? Or, at least tolerated each other? Of course they have. But in the past there were bounded diversity spaces. Port towns or centers of trade or capitals of empire are classic examples, spaces where political and religious and commercial interests required the presence of very different kinds of people. Such bounded spaces existed in microscopic versions as well. The famous bar scene from *Star Wars* is an interplanetary version. And I remember when I read Herman Melville's novel *Moby Dick*. What a diverse crew that ship had.

One reason diversity feels different now is because *diversity spaces are no longer bounded*. Everywhere on earth is a diversity space. The term no longer sorts things out, because diversity is everywhere.

Another reason diversity feels different is because of *rhythm*. In the past, a new population would appear and as time would pass they fit into and altered the local historical flow. Where I live now in New Mexico, the Athabaskan Indians—ancestors of the Navajo and Apache—rolled into the land of the Pueblo Indians by 1500, some say earlier than that. The Pueblans themselves, who had arrived thousands of years ago, speak several languages, so it isn't hard to imagine diversity issues at ceremonial sites like Chaco and Mesa Verde. The first Spanish settlement was founded in 1598. The Americans annexed the Southwest in 1848. Now Santa Fe officially celebrates its tricultural identity in tourist brochures, though the predictable tensions brew under the myth and occasionally blow through the surface like historical magma. But at least all those diverse groups had some time to get used to each other, for better or for worse.

It’s not like that anymore. Diversity shifts and moves like an amoeba on steroids. Encounters with *new* diversity in one’s lifetime will likely happen many times, indirectly if not directly. The rhythm of diversity has accelerated from whole notes with a couple of full rests to a twelve bar flurry of sixteenth notes that make for what jazz genius John Coltrane called sheets of sound.

Diversity has gone from bounded to everywhere and from infrequent to continuous. Maybe it’s not quite that dramatic, but it often feels that way. The reason so many people and

organizations all over the world are all of a sudden worried about diversity is, it's everywhere, all the time.

Diversity is a problem, something a lot of different people and organizations think they need to do something about. Listen to the complaints and it's obvious that diversity is used to explain why something isn't working right. What isn't working right? How do you tell? Things don't get done as easily as they used to. It's not that anyone necessarily or even usually has a personal goal to disrupt those things—I'll use *tasks* as the general cover term for things that people are doing at any particular moment. True, there are always some people around who enjoy destroying a task, with or without diversity. That's the universal and eternal problem of what to do with the terminally obnoxious and the town drunk.

No, people, usually with good intentions at first, have different notions of what a particular task actually is and different expectations of how one should go about doing it. More and more often, diverse people suddenly, perhaps surprisingly, find themselves doing the same task together, perhaps face-to-face, perhaps at a distance spanning half the globe. On a local level they work together. They live together. They go to the same school. When they get sick they go to the same hospital, and when they get in trouble they deal with the same police department and court system. They vote in the same elections, in places that have them, and they fill out the same tax forms. On a global level they often buy the same products – wherever they live – work for the same international companies, eat at the same restaurants, suffer the same wars, have the same media, articulate the same ideology, travel to the same places for vacation, and, if they are high flyers, buy and sell in the same global markets.

But, all those people sharing a task do not see things the same way. They have different perspectives, on what they believe, on what they value, on how they feel, on the general way they think things should be done, and on the specific details of what any particular task involves. The differences might be trivial and easily change. “Oh, sure, sorry, didn’t know that’s how things worked here.” Or the differences might be deep-seated, learned as a child and used habitually as an adolescent until they became the natural order of things. “What? That’s ridiculous. No one in their right mind would do things that way.”

The original good intentions can turn into annoyance and ferment into anger. For a person who grew up in a specific place, it can turn into hatred of outsiders. For a new arrival, it can turn into feelings of persecution and intolerance. For people at a distance, it can turn into censorship of media and outsider contact. For any person trying to do a task with others, it can turn into frustration that makes them want to do the task only with people who think and act just like them. Taken to extremes, it turns into war. Tasks that started with purpose and value go straight to hell in a handcart.

Sometimes the intentions and expectations are poisoned from the start. An ancient historical event turned into a myth that fuels generations of hatred, an image of *those people* crystallized and hardened from real past experiences of oppression into a need for scapegoats to explain why something in life has gone wrong. This is the culture-diversity problem with teeth in it, harder to change because it’s a core part of who the malcontents think they are.

Historical events or past experiences may have left a residue of lives gone terribly wrong. The theft of an ancestor’s land, commerce that destroyed the usual way of making a

living, invaders forcing aside at gunpoint beliefs and values that define who you are—or rather, were. The diversity problem might have deep roots indeed.

How do we even begin to untangle all these "cultural" or "diversity" issues? Are they "cultural" at all? What could it possibly mean to say that? That's why I wrote this book, to try for a different angle on this so-called diversity problem, to try and understand better where culture came from by going back in the origins of modern humanity about fifty thousand years ago, one traditional estimate of culture's debut now turned controversial, an issue we'll revisit later in the book.

The emphasis in this book will be on how people with different perspectives—call them diverse or culturally different—might better handle that diversity. If enough people handle it better—either because of something in this book or because they figure out something better—things will improve long before any policies or programs accomplish anything. My motto for change is a quote from a three by five card that I saw tacked to the wall of a waterfront Texas bar. The card said, "I must go, for there go my people, and I am their leader." Oddly enough, the card paraphrases a famous quote from Gandhi.

You see what I mean about culture? What's Gandhi doing on the wall of an oysterman's bar?

It's Hard to Fix Culture with Culture

In spite of all the problems using the culture concept, this article of faith endures: Culture is causing problems, and therefore culture is where we can fix them. This premise has

grown like kudzu over the course of my student and professional life. "Intercultural communication" became a publishing and consulting gold mine, as did fields related to other terms used in this book like "diversity training."

Several years ago, at the point when the US adventures in Afghanistan and Iraq were starting to be widely recognized as the catastrophes they now so obviously are, I was invited to be a plenary speaker at an all-military workshop. One of the organizers had read my book *Language Shock*.

More interesting than the presentations were the conversations with officers of my age from different branches of the military. They, like me, had been shaped by the Vietnam War. In quiet sidebar conversations they said they couldn't tell the Secretary of Defense and the Commander-In-Chief that they were naïve fucking idiots. They needed people like me and the other invited intercultural experts to say it for them. One guy actually used those words; the others put it more politely.

The problem, they said, was culture. Their professional lives as warriors had been distorted by naïveté about Vietnamese "culture." The current Afghan/Iraqi story, they felt, was just a replay of the same problem. The answer? Teach military and civilians about the culture of a place before doing anything about it. As one snarky Brit put it, "War is god's way of teaching Americans geography."

That experience led to a couple of projects that showed how "culture" was difficult to use to solve problems that it itself had created. I was part of a team assembled to design a "serious" videogame. Its purpose? To teach different communication styles to American NGOs

and military on their way to Afghanistan about the "cultural differences" that an American would likely encounter.

Anyone who knows Afghanistan also knows how insane it is to try and describe the country in terms of a single "culture." Not to mention generalizing the American culture of the students in a way that made any sense. And anyone who knows the country will also that Afghanistan is often called "the graveyard of Empire." An Anglo–European face of an economic development expert is just another in a long line of English, Russian and now American faces with ambitions to run the country, no matter how he or she talks.

The team I worked with, all oriented towards the details of language, did an exemplary job of creating a game given the destructive micromanagement and flaky fiscal behavior of the federal security agencies we dealt with. But in the end the game wasn't going to solve the intercultural problem. While I was working on the project, there was a scandal in Afghanistan when some American soldiers burned copies of the Koran. Had they known how to open a conversation and speak indirectly—the lessons of the game we developed—I doubt it would've made much difference. As a cynical friend teased me, “Whoops, you forgot to tell them not to burn the Holy Book of Islam."

Is there any way to use the culture concept to solve rather than cause problems? Especially in this day and age? People doing the same task together are probably hybrids under the influence of multiple cultures that differ in fundamental ways—even within themselves—in how that task in particular is supposed to work. But, maybe, if we invest some preliminary labor on the definitions that most people don't worry about when they use the “C” word, we can then make use of the “culture” concept.

Going back to the old days, culture never meant just one thing in anthropology, but two, neither of them well defined, but at least there were only two. One meaning was what we've been talking about so far, for now let's just say the beliefs and practices of a specific group. In the old days, a “specific group” was a small poor isolated community in the “third world.” But a second meaning was that culture labeled those abilities that differentiate humans from other animals. All humans have culture; no animals do – that was the simple assumption in the old days that we’re going to undermine in this book.

In graduate school, the study of specific groups was emphasized. The more general concept – culture as what it meant to be human – was neglected. In fact, it was amazingly simple to mistake a piece of one's own particular culture for what must be true of all of humanity, a widely distributed personal problem called "ethnocentrism." It is just this second version of culture – what humans have in common – that offers common ground for connection no matter what the culture-specific differences might be.

Culture, Big C and Little C

Something remarkable happened about 50,000 years ago, something that really does look like it set humans off from the rest of the animal kingdom. Compared with the four and a half billion years the earth has been around, the modern human story hasn't gone on all that long. By one set of estimates, hominins—awkward jargon for the human line—split off from the chimps about five million years ago. Major changes happened along the way, from more ape-like to more human-like, from one tool technology to another. But, by and large, changes were

slow and, once they occurred, they looked similar wherever they were found by archaeologists many millennia later.

But starting about 50,000 years ago, and increasing from then on, this slow pace of change sped up dramatically. With this turning point, the experts start talking about Homo sapiens sapiens instead of just Homo sapiens. They didn't just look like us, as the earlier Homo sapiens had. They acted like us as well. (Some recent work argues that the sharp dividing line between Homo sapiens' emergence about 200,000 years ago and the appearance of homo sapien sapien culture about 50,000 years ago no longer holds. I'm going to use "Homo sapiens" for both. Context will make clear what time period is been discussed.)

> Before 50,000 years ago, human anatomy and human behavior appear to have evolved relatively slowly. After 50,000 years ago, anatomical evolution slowed while behavioral evolution accelerated dramatically. Now, for the first time, humans possessed the full-blown capacity for culture, based on an ability to innovate. They had evolved a unique capacity to adapt to environment not through their anatomy or physiology but through culture. Cultural evolution began to follow its own trajectory and it took the fast track. Even as our bodies have changed somewhat in the past 50,000 years, culture has evolved at an astonishing and ever-accelerating rate (Klein & Edgar, 2002, p. 21).

Notice that Klein and Edgar say 50,000 years ago. Other say 40,000, as you'll see in quotes to come. In fact, the current argument pushes the date back even further. Homo sapiens emerged about two hundred thousand years ago and one of the great mysteries of

evolution has been why it took one hundred and fifty thousand years to get culture going. Nowadays the hypothesis is that the objects usually taken as evidence of culture's emergence appeared much earlier in the archaeological record. We'll see later that the takeoff curve allows for this. For now, I'll stick with the less controversial date range, 40 to 50,000 years ago, give or take a couple of months.

Klein and Edgar call this remarkable transition the “Culture Big Bang.” Jared Diamond, in his book *The Third Chimpanzee*, calls it the “Great Leap Forward” (2006). Harris and Johnson, in their introduction to cultural anthropology, described it as a "cultural takeoff:"

> About 40,000 years ago, the relationship between cultural and biological evolution underwent a profound change. Although there was no increase in the average size of the human brain, the complexity and rate of change of human sociocultural systems increased by many orders of magnitude. It is clear that a kind of takeoff had occurred whereby culture began to evolve more rapidly than our kind's genotypes. (2006)

Merlin Donald, in his book on cognitive evolution, writes that “Humans are better and faster at everything: social coordination, tool manufacture, systematic war, finding and building shelter, gathering and hunting food” (1993, p. 210). Living spaces became more organized. Humans buried their dead with more ritual. Production of clothing out of hides improved. Hunting became more sophisticated. Tool making developed and ornamental figures and jewelry appeared. The Big Bang allowed humans to:

> …extract more energy from nature and invest it in society. It also allowed human populations to colonize new and challenging environments. Possibly the most critical aspect of the neural change was that it allowed the kind of rapidly spoken phonemic language that is inseparable from culture as we know it today. This ability not only facilitates communication, but at least equally important, it allows people to conceive and model complex natural and social circumstances entirely within their minds (Klein & Edgar, 2002, p. 24).

Notice the emphasis on language in this quote. Historically, anthropology considered culture and language as the domain of two distinct subfields. As a result, discussions of cultural evolution and linguistic evolution are often kept separate from each other. I'm going to follow this artificial distinction in this chapter and the next, though the next chapter on language will begin to merge the two into a single phenomenon..

We used to say that this increased pace of innovation and change marked the birth of both culture and language. We still do, but that claim is more complicated now. We know that animals can cogitate and communicate much more than we ever thought they could, and that hominins before Homo sapiens could, too. But even though our claim now shows more respect to our human ancestors and animal contemporaries, the data still show that Homo sapiens made some kind of evolutionary leap. Whatever they started with that they shared with animals and earlier humans, they took it well beyond anything that had happened before.

What was this something that made the difference? A number of researchers have suggested answers to the question over the years. I don't mean to review and evaluate them all

in this book. The hypothesis here, born of reading a sample of evolutionary experts and bringing in my own background in linguistics, will run like this: Humans developed a more elaborate *generative ability*, an ability to look at a task, analyze it into parts, recombine those parts in a different way and create new ones, and change the task, for better or for worse. We'll see that this ability had its roots in what earlier hominins could do, and we'll see as the book goes on that language worked particularly well to help it along.

But then something also had to evolve to keep this new ability in check. If the new humans started generating away, every moment of every day, early Homo sapiens would have looked like a faculty meeting and accomplished about as much. Something had to co-evolve with the new generative ability to *constrain* it and keep it under control, but without at the same time destroying it. Those constraints, as the book will argue later in this chapter, gave rise to culture in the way that we usually talk about it now, culture as a system to reign us in and glue us together into small groups.

Generativity was part of the new universal human ability that we call culture. Constraints held the innovations that were generated together into local clusters. We call those local clusters "culture," too. The trend in my lifetime, in anthropology, has been a shift in research from the local culture to culture as something characteristic of humans in general. Local culture is what causes the problems; human culture is where we might find some solutions. Such is the argument I hope to develop here.

Growing "culture" out of "Culture"

In the next few sections, I'm going to write about *generative* and *constraint mechanisms* and how they balance each other out. Or rather, how they used to but don't so well anymore because hybrids mix things up. I know that a lot of people don't care for that term "mechanism." It does call up images of machinery, of Charlie Chaplin spinning around in the gears of a machine in the movie *Modern Times*. Many people prefer the term *process*. The truth is, process isn't that clean a term, either. Since I recently learned some Argentinean history, I'm sensitive to it. The generals called it *el proceso militar* when they disappeared several thousand Argentines in the 1970s. If that isn't bad enough for you, the original German title of Kafka's novel, *The Trial*, is *Der Prozess*. Then there's *processed* food. How about a Velveeta and Spam sandwich while you wait for the midnight knock on the door and the kangaroo court that follows? As far as connotations go, for me anyway, *mechanism* beats *process* by a country mile and, so that's the word I'll use.

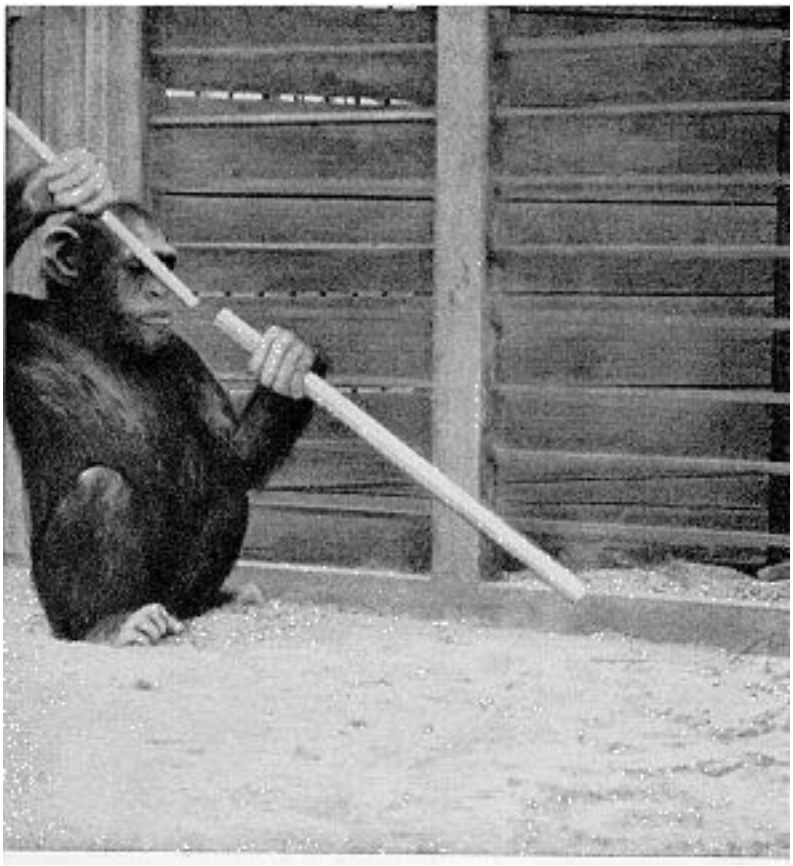
Once the Big Bang occurred, "…the great increase in artifactual diversity through time and space provides the oldest concrete indication for ethnographic 'cultures' or identity-conscious ethnic groups" (Klein & Edgar, 2002, p. 233). And as they often do, they use the term *innovate* as a key description of what happened. They write that, in Africa as well as in Europe and Asia, "…innovations included solidly built houses, tailored clothing, more efficient fireplaces, and new hunting technology" (pg. 235).

Homo sapiens did things differently when compared to the Neanderthal in Europe and the early modern humans in Africa. They became more innovative, more creative, more capable of experimenting with new possibilities. If I were naming Homo sapiens, I'd call them the *tinkering* humans, Homo tinkerus. The Oxford American dictionary defines "tinker" as an

“attempt to repair or improve something in a casual or desultory way, often to no useful effect.” “Often,” but not “always.” Tinkering strikes me as exactly the right word for what Homo sapiens started to do.

This new human ability to tinker, to innovate, to generate, is called *culture*. Notice how different this is from the usual contemporary use of the term. "Culture" in the phrase "Culture Big Bang" doesn’t mean the unique beliefs and practices of a particular group. Instead, it labels something that evolved as part and parcel of the human condition, a new ability that earlier humans and animals did not have, certainly not to the same extent. The ability—call it *Culture with a capital C*—is another name for the ability to *generate*. It means, step back, analyze a task, reconfigure it, and do it a different way.

As we'll see again and again in this book, there is a slippery slope here along the human-animal border. The example in the image below dates back to the early 20th century. Wolfgang Kohler, a founder of Gestalt psychology, showed that chimps had a generative streak in them as well. In the picture below, Sulton has analyzed the situation and figured out that if he put some sticks together he can reach the food hanging outside of his reach. This generative ability shown by animals is, however, less sophisticated than that of humans.



https://www.google.com/search?q=sulton+chimp&espv=2&source=lnms&tbm=isch&sa=X&ved=0ahUKEwjv6sK1i9nSAhWh64MKHZ9ZBuMQ_AUIBigB&biw=779&bih=421&dpr=3#imgrc=uIzprkAr6hD6GM:

Culture with a capital C allowed for the creation of cultures with a small C, what Klein and Edgar described earlier as “identity conscious ethnic groups in the modern sense” and “ethnographic ‘cultures.’” The new generative ability set each hunting/gathering band off on its own trajectory, its own history of tinkering with a task to change how it was done. Within a single human lifetime, brief as it was in those days, several changes might occur in how various tasks were done. Language, of course, was also part of the universal human story, a part left

until the next chapter, but a part that also grew into *different* forms within each hunting/gathering group.

Culture with a capital C, the new generative ability of all Homo sapiens, made it possible for what we now think of as cultural differences to appear. To distinguish these group-specific differences from Culture with a capital C, I'll call them *cultures with a small C*. Culture with a small C means that different hunting/gathering bands put the new ability to different uses. Changes over time took “small C cultures” in different directions depending on how they started and what they needed to do next in their local worlds. The development of variety among cultures with a small C is what archaeologists discovered in the variation in the archeological record starting roughly fifty thousand years ago, and those cultures with a small C are what traditional anthropologists studied primarily.

Cultural diversity was born out of a universal human ability to make and change a culture. This book will argue that that universal ability is where the contemporary solution to cultural diversity lies. When problems arise as a function of conflict among cultures with a small C in the same task, the answer isn't to tinker with the details of the small C cultures in question. The answer—or so this book will argue—will be to scale up into the superordinate category that includes all local small C versions, what we’re calling culture with a capital C, the basis for the shared humanity of those who are having the problem in the first place. That’s where similarities are guaranteed to be found.

What changed, about 50,000 years ago, were the number and type of innovations across many different tasks that varied from group to group. The archaeological record shows more effective hunting techniques and better ability to survive the harsh environments of the

Late Paleolithic. It shows more cooperation in raising children. It shows population growth and longer life expectancy, care of the sick and funerary rituals for the dead. And of course the cave art and jewelry and flutes. The innovations increased evolutionary success for some bands, which in turn selected for an increase in ability to innovate, which then improved evolutionary success — That's the kind of *positive*—or *amplifying*—feedback loops that make things increase at an increasing rate. It put the "bang" in "culture big bang."

But the term "evolution" now has to expand beyond the biological. It's no longer only a matter of genetic inheritance with variation and natural selection. Anthropologists coined the term "dual inheritance theory," DIT in short, to recognize this fact (Boyd & Richerson, 1985). After the Big Bang, culture with a small C could be changed, by human will alone, at a speed limit that left the slow pace of natural selection in the dust, all thanks to culture with a capital C. (More on DIT later.)

Generativity

In his book on cognitive evolution, Donald draws on Michael Corballis' version of generativity. Generativity is both an analytic and a combinatorial skill. The argument is summarized in Corballis' book, *From Hand to Mouth* (2003).

Generativity, so goes the hypothesis, was the key mechanism that enabled innovation to increase dramatically. It produced all that variation in the archaeological data that supports the argument for the Culture Big Bang. The first part of Corballis' definition of generativity has to do with *analysis*. What does analysis mean? It means realizing that something is not just what it

appears to be in isolation. It means seeing a *whole* in terms of *parts*, in one of two different ways.

The obvious way is, the whole is seen as made up of other things. It consists of a number of interlinked parts. Perception shifts one level of scale *down* to the next lower level. Analysis changes the question from “What is this mechanism?” to “What is this mechanism made of?” and "How does it work?"

A second way to look at analysis: The *whole* is seen as *part of* some larger mechanism. It is seen in terms of what it contributes to the bigger scheme of things. Analysis shifts the question from “What is this mechanism?” to “How does this mechanism work as a part in some larger mechanism, what role does it play?” It shifts perception one level of scale *up* to the next higher level.

Let me entertain you with a bourgeois example. It is more about tools than it is about social routines, but it makes the point. I only recently became a homeowner, home-*moaner* my brother calls it. I've been an urban apartment renter most of my life. Many things that I saw as a whole when I lived in a rented apartment, I have now learned to see as a bunch of parts. To use Heidegger’s famous line, you don’t know what a hammer is until it breaks and there is no landlord to call. He didn't say that last part, but he must have been a homeowner.

There’s a garage door opener that isn’t just a garage door opener. It has a little electric eye light in the lower corner with a bulb that burns out, I learned while working on a draft of this chapter, at which point the opener quits and you have to figure out which parts to move which way so you can open and close the door by hand. And the outdoor faucet--it has a valve to prevent backpressure. It jams if dirt gets in there, an event that caused ethical dilemmas

when the plumber pointed out he could just shoot some epoxy in and the hell with it. And caulk? Don't get me started. I own more tubes of caulk now than I do socks.

Why are all you homeowners laughing? These are classic cases of shifting from a holistic view to an analytic view. Not to mention shifting from a rented city apartment to your own home in the 'burbs. It's how you learn to fix something that you never had to fix before, because you thought of the thing as a whole rather than as a system of parts.

Here's a bourgeois example in the other direction, seeing the whole as part of something larger. As a renter, I didn't pay property taxes, not directly. Now that I'm a homeowner, I do. Now when a list of issues appears on the ballot that requires a new property tax assessment, I pay attention. Am I willing to pay more for a new school when I don't have any school-age kids? Self-interest vs. community support becomes personal rather than abstract.

This ability to *analyze*—the first part of generativity—took off and generalized to all domains of life as part and parcel of the Culture Big Bang. And it wouldn't have just applied to objects. It would have generated music, art, more complicated social relations, and religious ritual as well. Seeing wholes in terms of parts and vice-versa can—emphasis on *possibility*—lead to changing the whole to make life better in any number of ways, better in many senses of the word, or, of course, also possibly worse, as in "if it ain't broke, don't fix it."

And some applications of generativity would have changed things just for the hell of it. They might not have served critical goals of food and sex, but they might not have gotten in the way, either. Even biologists say that most characteristics of a species are *not* the result of natural selection. They're the result of what they call genetic drift, i.e., changes that seem to

serve no evolutionary advantage, something especially common in small populations. It's easy to imagine that those early bands of hunter-gatherers produced a substantial amount of *cultural drift* as well. The concept has been around in anthropology for a while (Eggan, 1963).

Whatever the application, though, analysis means that the mechanism in question is made up of parts rather than an irreducible whole. It also means the mechanism can be seen as a part of something larger. It can go either way. Whichever way it goes, analysis opens up the possibility of new *combinations*—the second part of generativity according to Corballis' definition. Humans become what I called Homo tinkerus. Parts can be used and new ones can be created to be combined and recombined and added to and subtracted from in different ways to change the nature of the whole.

Now that you're aware of the separate pieces, *how can you put them together in a different way?.* According to one definition, combinatorics is "the branch of mathematics studying the enumeration, combination, and permutation of sets of elements and the mathematical relations that characterize their properties" (http://mathworld.wolfram.com/.html). Analysis takes care of the *enumeration* part of the definition. Combinatorics then shows the many ways that the parts can be reshuffled into different combinations.

In the Culture Big Bang, new combinatorial possibilities opened up the world of tinkering, of trying something different that might improve the performance of a particular task. Let me illustrate with another bourgeois story from the life of the new homeowner. I should add that my father was a photographer. His idea of training me to fix things was to pick

up the phone. Smart man. On the other hand, he used a beer can opener to open film cassettes rather than buying an expensive tool at the store.

My house has an old wooden screen door. The first summer I lived in it, the door had shrunk so much that a crack opened at the top and many winged creatures started commuting inside. Never in my life had I thought of a screen door as anything more than a screen door. It just hangs there and lets fresh air in. So I stared at it and tried to imagine parts that would fix the sag, or fill the gap, or something. For the first time in my life, I was deeply into screen-door analysis.

I won't bore you with all the things I thought of. You're probably bored enough already, unless you're a homeowner who enjoys the occasional moment of schadenfreude. After an extensive period of screen door meditation, I wondered why there wasn't a part that was kind of a stick that mounted crossways at an angle from the hinge side of the door to pull the sagging corner up. I went to the hardware store and it turned out there was such a thing. Not many of them, because screen doors tend to be metal now, not wood. So I bought it and took it home and adjusted it and it worked like a charm.

The example shows the results of tinkering with new combinations based on what one comes up with by analyzing a whole. It also shows how we can imagine parts that might be there but aren't. Humans aren't limited to just the parts that they come up with from the analysis of the moment. They can combine and recombine those, of course. But they can also imagine other parts that aren't there, or discard parts that are. They don't *just* do combinations of what is in the set, like the mathematical definition says. They *change* what is in the set as well.

Gregory Bateson's concept of *deutero-learning* offers a classic way to think about this change (1972). To translate his concept into the discussion here, I'll call it *combinatorial learning*. Imagine that at a particular time a person can choose among some arrangement of parts. If he or she *changes* the arrangement, that would be one kind of learning. Straightforward generativity. Simple analysis and combination. That kind of rock makes a better tool than this kind. This kind of screw holds the screen door better than that kind. This car gets better mileage than that car.

But now suppose that a person doesn't just change the combination. They change what's *in* the set of available parts to make a new combination. Now there's a different set of parts, new ones that weren't in the set before and old ones that have disappeared. Instead of picking a better rock, let's try a stick. Instead of a screw, let's glue it on. Instead of a car, let's buy a bike.

The late Waldo the cat offers a good example of the difference. One day I came in to feed him and he'd chewed an almost geometrically perfect head-sized hole in the side of a bag of cat food sitting on the counter. That was pretty good tinkering on his part. But when a door was installed to let him go in and out of a window, it took a long time and a lot of unsubtle training before he finally got it. He preferred to continue sitting on the back porch, yelling for someone to open the sliding door. Eventually, after a lot of work, and a lot of undignified shoving and scratching, Waldo combinatorial-learned, but it took a while, and his humans had to force him into it, over and over again.

Humans, on the other hand, combinatorial-learn all the time. Once Homo sapiens developed generativity, they could do combinatorics in more sophisticated ways than animals

and earlier forms of humanity ever had before. The combinatorial possibilities increased, not only because Homo sapiens saw wholes in terms of parts, but also because they imagined new parts that weren't there and saw old parts as items that could potentially be discarded. The temperamental artist and the idiot savant were born.

Analysis and *combination*. Generativity mixes the two into a key mechanism that produced the Culture Big Bang. But generativity also created a problem, namely, the potential for chaos. Imagine if our ancestors had turned on the generativity and never slowed it down. If generativity just took off like that, *unconstrained*, the Culture Big Bang would not have been a Great Leap Forward, as Jared Diamond called it. It would have been the explosive end of the Homo sapiens experiment. We might all be Neanderthals now, or possibly a nonhuman branch of the great apes. Maybe the better for it.

Let me mention a couple of contemporary global examples to show the consequences of unconstrained innovation. Consider the so-called war on drugs. The primary constraint, supported by budget and public opinion, has always been law enforcement. It has failed, spectacularly and repeatedly. Innovations in production and distribution have continued since the "war" was declared in 1971. As my colleagues in law enforcement often said, "the bad guys are always one step ahead of us." With such a high-revenue dependency-producing product, law enforcement has proven incapable of constraining illegal drug epidemics. Another example is the current planet wide environmental crisis caused by explosive technological innovation since the Industrial Revolution and especially since the 1950s. The lack of constraints on environmental damage may well have pushed us beyond our ability to repair it.

Constraint Mechanisms

To explain why our ancestors did not in fact self-destruct, I need to introduce a second family of mechanisms that innovation produced, what I'll call *constraint mechanisms.* These mechanisms are *conservative* rather than innovative. They slow that innovation curve down with dampening or negative feedback loops. While generativity sparkles with new possibilities, constraints muffle them, apply the brakes, and try to keep generativity under control.

The difference between the two mechanisms correlates roughly with an *individual* level versus a *social* level. In general, an individual does generativity. An individual takes a look, analyzes, combines in a new and different way, and creates a way of doing something. The key innovator is usually a person. Not always, though. A group might sit around and collectively analyze and combine. The concept of "brainstorming" is a case in point. There's a famous scene in the movie *Apollo 13*. The boys in the space capsule are in trouble. The boss back on the ground walks into a room full of engineers. He lays down some material. This is what they've got to work with, he says. This is the problem they have. Figure out how they can fix it. Classic collective generativity, though I'll bet there were one or two generative leaders in the group.

But, by and large, some person usually has the bright idea first. At least that's my hypothesis. William James, quoted in the Stanford Encyclopedia of Philosophy article on cultural evolution, provides a nice quote:

> This social evolution is a resultant of the interaction of two wholly distinct factors: the individual, deriving his peculiar gifts from the play of physiological and infra-social forces, but bearing all the power of initiative and origination in his own hands; and second, the social environment, with its power of adopting or rejecting both him and his gifts. Both factors are essential to change (1890, p. 448).

Constraint mechanisms, as we'll see in the next several chapters, are more social than individual. Several experiments dramatize how social mechanisms shape and control individual perception and action. But here, too, things aren't quite so clear cut. Except for psychopaths, individuals also carry social constraints around with them. Freud called it the superego; George Herbert Mead called it the generalized other. Foucault created a theory of governance out of it, and Bourdieu, illustrating the tendency of researchers to isolate themselves by creating opaque jargon, called it doxa. In fact, the question of how a person incorporates society into their sense of self has been one of the major themes of social theory since its inception.

For present purposes, I only want to take a look at the *general* idea of constraints. Constraint is an ordinary word, used in many domains, for example in mathematics to business to everyday conversation. My dictionary defines it as a limitation or restriction. Mathematicians see it as an inequality—The number of glasses of wine I drink with dinner should be two or less if I'm driving, in other words $N < 3$. Washington colleagues use the term to define politics as the art of the possible. Sherlock Holmes translated it into the principle that if you eliminate all possibilities but one, then that one had to be true.

The general argument is this: The constraint mechanisms that evolved with the Culture Big Bang made sense as a way to stabilize generativity in hunting/gathering bands in late Paleolithic environments. But the same mechanisms that produced those cultures with a small C are now maladaptive in contemporary global society. We Homo sapiens still need constraints to balance generativity. But the mechanisms we inherited, suitable for the ancestral condition, are the wrong ones for today. The early days of social psychology can help make the dilemma clear.

Social psychology started out as a science more dismal than economics. Solomon Asch showed that under social pressure a person would claim that two lines of different lengths were the same; Muzafer Sherif showed that if you divided a bunch of kids into two groups they would quickly and intensely dislike each other; Philip Zimbardo showed how if you created a fictitious prison and assigned students to either a prisoner or guard role the guards would become vicious and the prisoners oppressed; Stanley Milgram showed that with encouragement from an authority figure one person would electrically shock another into silence. Results of their research were more subtle than that. But, on the whole, their experiments showed us that we weren't the independent rational open-minded noble creatures that we thought we were.

Let's start with the mother of all universal constraint mechanisms. Since your hunting/gathering band is more trustworthy than people in those other bands, and since your fellow band members and leaders confirm through social pressure and authority that your way of doing things is the right way, then the world must be exactly like you and your other band members think it is.

This absolute certainty constrains generativity right at its very heart and soul, because generativity depends on the ability to step back, analyze, recombine old and imagine new parts, and come up with something different. If things are as they should be, why would anyone in their right mind want to change them? Shades of Voltaire. We live in the best of all possible worlds. And that's in part because we've figured out how the world really is, and pretty much everyone in our band agrees.

According to social psychology, people believe, by and large, that their own perspectives aren't perspectives at all. Instead, they believe that they possess an accurate and objective map of reality. A perspective that is different from one's own, then, by definition, is naive, misguided, a personality problem, delusional, or just plain dumb.

Moskowitz describes this as *the* core problem for social cognition, right in the first chapter of his overview of the field. Most humans, he writes, live in a state of grace that social cognition calls "naïve realism." Moskowitz defines it as "the belief that our experience of things is one of an objective reality opening itself up to us" (2005). According to naïve realism, people don't think they have a perspective linked to reality in some way. They think they have an accurate and complete map of reality, period.

The problem is this: Decades of research in social psychology and social cognition show, beyond a shadow of a doubt, that objective reality is never the only thing that any human actually experiences, maybe not even most of it.

Now for a cautionary note worth some emphasis: No one--in the field of social cognition or in this book--is about to go to the other extreme and claim that the world is only a mental construction. Neither Moskowitz nor me nor anyone else with a shred of sense thinks that

reality plays no role whatsoever, or worse, that it doesn't exist. Most of us understand that there's a reality that predates our arrival into a particular task, a reality that will continue long after we've left, whatever changes might have been made to it.

But, as the field of social cognition shows over and over again, humans tend to collapse their perspective *and* reality together and call it *all* objective reality. True, all human knowledge is embedded in a perspective. Buddha and the transcendental phenomenologists disagree, but, with all due respect to followers of the Gautama and Husserl, I think that they've just achieved a higher level of naïve realism. The truths derived from meditating, or from bracketing, as the phenomenologists say, can be powerful indeed. But they always remain, in part, a product of the perspectives from which the meditating or bracketing was launched and to which it must return. A human can't escape it.

Naïve realism is a human universal, the mother of all constraint mechanisms. The hypothesis is that it coevolved with generativity to keep the innovations that analysis and combination made possible coherent enough to form local culture with a small C. But there is more to the story of generativity and constraints than the universal human part. The phrase "the Big Bang" calls to mind an explosive moment. But once we turn the photo into a film we will see innovations turn into constraints on further innovation and we will also see constraints inspire innovations when a particular constraint hinders rather than helps task performance. In other words, the mechanisms work at different levels of scale. The appearance of generativity and constraints in the Culture Big Bang made the mechanisms possible, and then the historical trajectory of different bands applied them iteratively in the details of the tasks that made up lived experience.

Computer Critters Go Hiking

I'd like to show in an abstract way how they work together—generativity and constraints. The computer can serve as a toy for the exercise. John Holland, one of the founders of complexity science, created what he called a *genetic algorithm* to show how the two balance each other out in action, not only as a general theory, but also as a practical tool to solve real-world problems.

Here's an example of how Holland's model works (1995). A favorite of the computer modelers is the *knapsack problem*. It caught my attention because of how I felt when I first tried backpacking. Mostly backpacking taught me why god invented burros. But it also made me aware of the problem of getting the most value out of the items that you can jam into a pack. As any backpacker knows, there are other important considerations like weight, especially, but this model is based on size and value.

The knapsack problem goes like this: You have a bunch of things of different sizes and values, and you want to get as much total value out of the full knapsack load as you can. "Value" here means use value—usefulness while you're in the backcountry. A classic "combinatorial optimization" problem, as the computer types call it. Now, how to solve it with algorithms that *constrain* the innovations that might be created.

The problem has to be represented in a computational kind of way. First create a world of computer critters. Imagine them as a bunch of little stick figures on a screen. Give each of them an empty knapsack of the same size. To describe the things that can go into a knapsack,

use two numbers, where each pair of numbers tells you the *size* and the *use-value* of an object. There are a lot of different kinds of objects, big and worthless, big and valuable, small and valuable, small and worthless, and everything in between those extremes. So we start the computer run with a couple of hundred critters and give each of them some objects that vary randomly in sizes and values. Into the knapsacks the objects go.

That's the first *generative* step. Now we come to the *constraints*. To translate constraints into something the computer can understand, define a *constraint function*, something that says how good or bad each combination of things in the knapsacks in fact is.

Notice here how the generativity/constraint loop is now tied to a task, something we require prior to any discussion of culture with a small C. Generativity is innovation to change how some task is done. In this case, the task is backpacking. How do we figure out how to pack the best backpack? How do we tell as we innovate which pack is better than another?

The first thing the constraint will do is check the size limit. A knapsack can only carry up to some maximum total size of items. So, for each critter, the function adds up the total size numbers of all the items in the knapsack. If the size is too big, the function can just let the critter remain but remove items from the knapsack at random until all the items fit.

Now to the *second* part of the constraint function. It sums the use-value of all the items that now fit in a critter's knapsack. It turns out that just by chance some knapsacks will have a collection of objects that sums to a higher value than others do. Those critters have a head start in the game, because they're closer to the best possible arrangement that a knapsack can hold. They've lucked into a better knapsack load than the other critters.

Now for a major constraint on what happens next. The critters with higher value knapsacks are more likely to “reproduce” with each other, metaphorically speaking. All critters will be paired with another, the probability skewed by value of what’s in the pack. It is the computer scientist’s way to apply an evolutionary metaphor to a mechanism of social change.

When they reproduce, two critters will swap some of their own size and value numbers that represent what is in their knapsack. For example, each critter might cut its own list of size/value numbers in half, then give one half to another critter and take half of theirs back in return. Now each critter has a new string of numbers, a new arrangement of items with different sizes and values in its knapsack, and the constraint function starts a new cycle. It checks to make sure each critter’s knapsack isn’t overloaded, and then it sums up the value of all the things in each knapsack. Some critters will be doing better than they did before, some worse. Then they all pair off and reproduce again, the ones with higher backpack values again tending to pick ones with higher backpack values.

If this is starting to sound like the luck of the draw followed by the computer critter equivalent of going to the right schools, that's because that is exactly what is going on. One result of such so-called “artificial society” models is a rapid increase in disparity of wealth, or in this case, disparity in value of backpack loads.

So you see how this thing works? Starting from just a random assignment of items to knapsacks, the critters that carry around the higher total value keep reproducing with each other, over and over again. The same *constraints* apply on each cycle--stay within maximum size of the knapsack and make it more likely that those critters with high total knapsack value trade knapsack items with each other.

Some of the critters will get more and more value out of what's in their knapsacks as time goes on. In the end, the genetic algorithm may not produce the absolutely best possible knapsack arrangement, but it will end up with a few ways to pack a knapsack that are high on the scale of best possible combinations of size and value. It will also end up with a lot of critters who are screwed, low value critters who keep exchanging in vain. And it will have done it without writing an equation or sitting there for hours trying all the combinations out. And, what's truly amazing, the genetic algorithm will do this in a very brief period of time. It's a simple but powerful example of how, in theory, innovations become constraints that can quickly shape and then just as quickly limit the world.

(See https://www.youtube.com/watch?v=ejxfTy4lI6I for an example. There are many more of these "artificial society" models on YouTube. Genetic algorithms often have a *mutation* function, where a few parts of the size/value string of numbers change at random for each critter every so often. That opens up possible combinatorial-learning. I won't worry about that part here.)

The computer model *cannot* combinatorial-learn like people can, in the way that Gregory Bateson described, if you recall the examples in the previous section. The critters can work with the original parts, but they can't consciously invent new ones. Not in this model. The computer doesn't say, "Hey, what if we put a couple of expandable pockets on the outside of the knapsack and some Velcro loops to hang things off the back? Or, "What if we thought up a better way to transport these objects, like loading them all onto a Drone and the hell with knapsacks?" But still, the computer helps visualize how constraints balance generative

mechanisms and give them direction. Without constraints the generativity would run out of control, like the amplifying loop between a microphone and speaker that produces a screech.

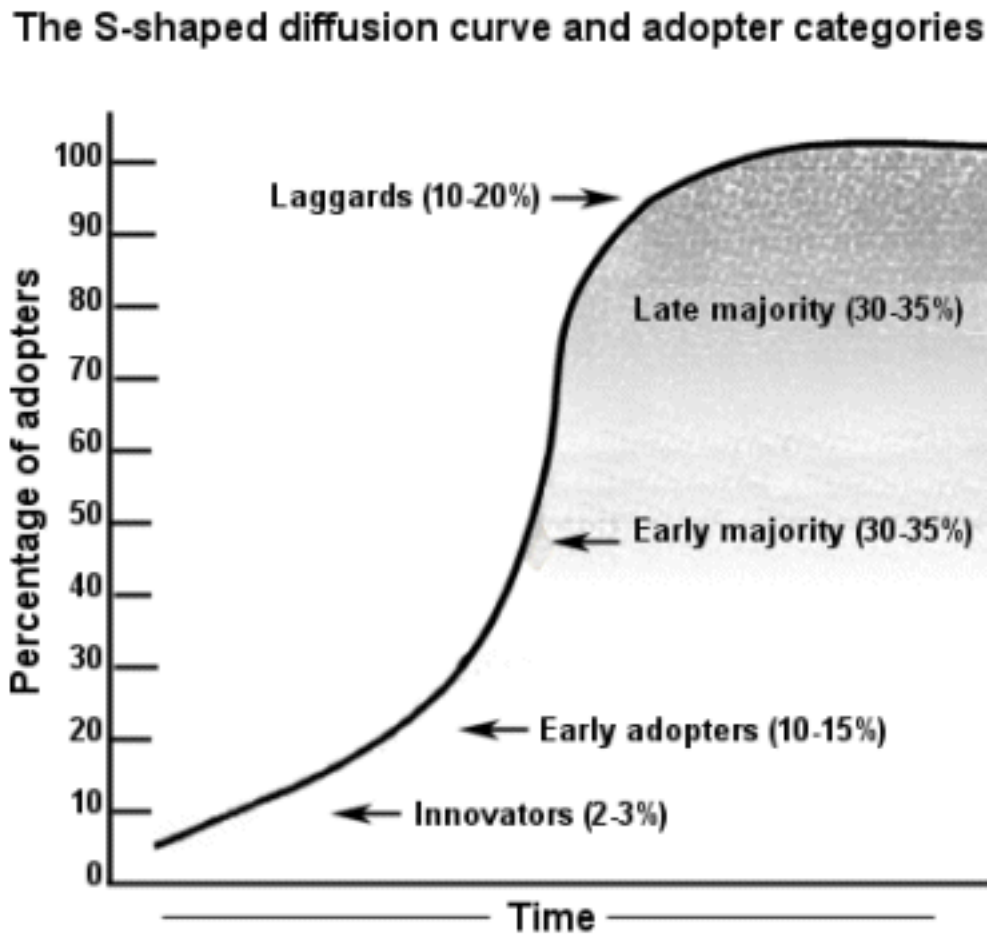
The amazing thing about Homo sapiens, with its bigger brain and its language—our ancestors could run a program in their imagination without having to do trial and error. As one colleague put it, the mind is a "social simulator." It's not an accident that Ben and Jerry didn't create Liver 'n Onions ice cream. They didn't need to develop and market it to see whether or not it would work. They just simulated it with their own internal genetic algorithms and their flavor selection function took care of the rest.

So what would a picture of this generative/constraint trade-off look like as it unfolded over time? In the Culture Big Bang, generativity took off and produced a dramatic increase in innovation. So far so good. That sentence describes the archaeological record starting around 50,000 years ago. But then things quickly started to stabilize. Ethnic or culture clusters formed, as the archaeologists Klein and Edgar called them in a quote cited earlier, and then those clusters stayed in place long enough to leave a consistent trace. That, too, corresponds with the archaeological record.

Waves of innovation from generativity. Stable patterns based on constraints. Then innovation to solve a problem that the constraint caused. It turns out this cycle—change and then stability and then change and then stability and so on forever—is a cliché in nature, not to mention in social theory. Gabriel Tarde, a founder of sociology, described growth spurts followed by slowdowns in his diffusion theory in the nineteenth century, based on imitation and innovation (described in (LaTour, 2005)). Even before Tarde, August Comte, another

founder, wrote of social statics and social dynamics—he was trying to imitate Newton—and how the two alternated in periods of innovation and stability.

A graph helps visualize the innovation/constraint dynamic over time, a graph of what the mathematicians call a logistic growth or S curve. Let me show you an example from the dozens found on the web. There are dozens because the curve describes so many different phenomena.



http://www.ohprs.ca/hp101/mod4/module4c10.htm

This particular example is linked to Rogers's work on diffusion of innovation (2010). We used it in previous work on illegal drug epidemics (Agar & Reisinger, 2002) The successful ones—"successful" might be the wrong word for widespread drug dependence—act like this S curve. In this context, the medical field would call it an epidemic incidence curve. But it could represent many other changes, large and small. Apple products often took off like this, the iPhone for example. Social movements could take off like this, the Tea Party for example, or Occupy Wall Street, or ISIS. Something doesn't exist and suddenly it seems like it's everywhere.

Not all innovations diffuse of course. Most of them probably never make it past that first lower turning point – "inflection point" they call it – as the curve shifts from a slow rise to exponential growth. And even successful innovations will eventually flatten out – the second inflection point – as the diffusion runs its course after it affects as many in a population as it is going to.

On the most general level, the Culture Big Bang had to have been this kind of change, slow growth off a baseline, a sudden turn upward into an exponential increase driven by generativity, then a flattening out as constraints fence off the limits of the space. The Big Bang metaphor is clear enough from the way the graph explodes upward. But what does that line represent? One way to think about it is, the line represents a rate of innovation--Very slow for a very long time, picking up a bit with Homo erectus and early Homo sapiens, as we'll see in the next chapter on language, then past the first inflection point and whoosh, the Big Bang. Then constraints kick in, not only biological selection, but also social mechanisms to slow innovations down long enough to try them out, accept or reject them, refine them, teach them, and put

them to work. Those social and biological mechanisms formed culture with a small C, and there was plenty of room in the space generativity opened up for many different variations.

Small C Culture Usually Defined As Constraints

If you look at some of the great definitional moments in culture with a small C research, the emphasis is clearly on this constraint part. Franz Boas, revered founder of academic American cultural anthropology, got right to the heart of it and used the word "shackles" to describe culture with a small C in a spirit close to this book.

> In fact, my whole outlook on social life is determined by this question: How can we recognize the shackles that tradition has laid upon us? For when we recognize them, we are also able to break them (Kardiner & Preble, 1961).

> Or consider this classic definition, from sociology in 1923:

> If men define situations as real, they are real in their consequences (Thomas, 1923).

One more example, this one by Ward Goodenough, a founder of the field of cognitive anthropology, is also often cited. Culture is:

> … whatever it is one must know in order to behave appropriately in any of the roles assumed by any member of a society (1957).

Consider what has to be one of the most frequently cited definitions in the world, that of Clifford Geertz in his book *The Interpretation of Cultures*:

> Believing, with Max Weber, that man is an animal suspended in webs of significance he himself has spun. I take culture to be those webs, and the analysis of it to be therefore not an experimental science in search of law but an interpretive one in search of meaning (1973).

"Shackles" is about social constraints, not about generativity. So are self-spun "webs," "consequences" and "appropriateness." A culture with a small C may be a beautiful or an ugly thing in the eyes of beholders or outsiders, but it is also a constraint, a limit, that works against generativity. That—so goes the hypothesis here—is exactly what it was designed to do.

Culture with a small C by these definitions, is more a constraining than a creative force even though it owes its development to the generativity of culture with a capital C. That's what had to happen in the ancestral condition. Evolution would not have been kind to a group of non-stop innovators. Probably, as the Big Bang curve turned upward, some hunting/gathering bands did conduct the experiment, a sort of late Paleolithic let a thousand generativities bloom. Some bands might have generated continuously. They wouldn't have lasted long.

And probably, once Homo sapiens started innovating at a rapid pace, other hunting/gathering bands conducted a different experiment. Those bands innovated but then overreacted with constraints and froze those early innovations into place. Too much in the way of constraints. Those bands, too, would probably have lost out in the evolutionary game.

But here's the good news. That ability to analyze and combine didn't disappear as constraints developed. And – one more time, just to be clear – the innovation/constraint dynamic reflected in the S-curve can apply at many different levels of scale. In the book so far, I introduced it for the culture Big Bang, the major transition from Homo erectus to Homo sapiens. But it applied on lower levels of scale as well. For example, I wonder who the first guy or gal was who came up with the idea of making a flute out of a piece of animal bone. I'll bet that person became very popular very quickly. And I'll bet that flutes diffused, first within the band of the innovator, and then with other bands with whom they came into contact. Or maybe most bands had tinkerers to whom the possibility was obvious after the Big Bang and it was a case of independent invention.

The different levels of scale are related, because the highest level is the Big Bang. It made the lower levels of innovations possible, which, in turn, themselves turned into constraints on further innovation. This is how capital C culture grew small C cultures of so many different sorts. And this is why figuring out cultural conflicts requires us to go up in scale until we get to the common humanity, available in the culture with a capital C Big Bang.

A Minimal Definition of Small C Culture

How can we begin talking about culture with a small C in some sensible way that can handle both the hunting-gathering band of the ancestral condition and the contemporary hodgepodge of cultural hybrids who have to deal with each other in our connected world?

Maybe we should just start with a very narrow and focused question to decide if we are dealing with something small C cultural at all. Here's a first try at it: If at least two people share a way of doing at least one task together, a way that could in principle be changed, then we could say that those two people share a culture for doing that task.

So if you want to call something "cultural," and use it to say that two people share it, you have to see them involved in at least one task together, and you have to be able to show that their way of doing the task could, in principle, be changed. In other words, they're *making sense* to each other in order to get something done, something that could in principle be done differently.

This is a minimal and provisional definition to get this book started. Notice that "culture" doesn't necessarily imply "community" in the sense of a face-to-face small group like hunter-gatherer bands in the ancestral condition. If I meet a stranger about my age who went to Catholic grammar school before Pope John XXIII, we will have several shared ways of making sense of tasks that we were taught by the nuns. It can serve as raw material for an improvisational comedy routine even though we have never met before. This example foreshadows the idea of an *imagined community*, a concept we'll put to work later in the book.

This minimalist definition of culture also works for animals, as it should given the new attitude in recent animal research. Consider the group of macaques who live on the Japanese island of Koshima. (See http://alfre.dk/monkeys-washing-potatoes/ for a brief summary).

Back in the 1950s, researchers began observing the band. The sweet potatoes they ate sometimes had sand on them. A monkey would just brush it off. Then one day a particular female got the bright idea of washing the sweet potato in the river. She was the first to do this. Her relatives quickly followed suit. The practice diffused and within a decade every macaque on the island was washing their potatoes. That same clever monkey experimented with dipping the sweet potato in ocean water which both cleaned and flavored it. That practice, too, diffused rapidly throughout the island. Now, though the original innovator and the original adopters are long gone, washing potatoes in seawater is common practice. It improved the quality of macaque life more than the iPhone did mine.

Does this mean we can talk about a culture of macaques on the island? By my minimalist definition, it does. At least as far as the task of washing the sand off their food goes.

This early research points to another theme that has already appeared in the book. Obviously potato washing isn't on the same level as a coordinated social activity like a mastodon hunt. But it does show that this culture business has a long pedigree that goes further back than the Garden of Eden and well beyond it.

The pedigree, which I only discovered working on this book, was recently the centerpiece of a National Academy of Sciences conference, titled “The Extension of Biology Through Culture,” reported by Alison Gopnik (2017). Here is a summary of the conference theme:

> The cultural transmission of behavior and artifacts provides not only our own species but also many non-human animals with a ‘second inheritance system’, built on the

> evolutionary foundations of the genetic inheritance system, but extending and interacting with it, in new and significant ways. Research on both human and animal social learning and traditions has burgeoned in recent years with many new and exciting insights and discoveries, often built through new methodological approaches.

Apparently dual inheritance theory doesn't just apply to humans.

Still missing – as mentioned earlier – is an equally clear concept of what "language" is all about in the Culture Big Bang story. There will be language with both a capital and a small L. So we'll take a look at language now and, along the way, slowly begin stirring language and culture together so that we can get to the concept of languaculture.