Dark Matter of the Mind:
The Background Forces That Shape our Words and World

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"...real bands are made primarily from the neighborhood. From a real time and real place that exists for a little while, then changes and is gone forever. They're made from the same circumstances, the same needs, the same hungers, culture."

Bruce Springsteen, E Street Band Induction Speech; Rock and Roll Hall of Fame[1]

[1] http://www.rollingstone.com/music/news/read-bruce-springsteens-e-street-band-induction-speech-20140411#ixzz33vGdN68Q)

INTRODUCTION

It sometimes happens in nature that things that are not seen may be more important than things that are seen. Atoms come to mind. And space. Astronomers claim that the matter of our universe that can be seen accounts for only some 5% of the material of the entire universe, whereas "dark energy" accounts for as much as 68% and "dark matter" some 27%. "We are much more certain what dark matter is not than we are what it is. First, it is dark, meaning that it is not in the form of stars and planets that we see."[2] In physics there is thus a place for explanations that involve things that appear to be unseeable in principle.

Consider the kinds of dark matter that direct human activities. One example, from Gellaty (1986) comes from poultry farming. It turns out that if it were possible to determine the sex of chicks as they hatch this would be of economic benefit in sorting chickens into laying hens vs. edible roosters, and so on. According to Gellatly (1986,4), in the "... 1920s, Japanese scientists discovered a method by which this could be done based on subtle perceptual cues with a suitably held chick. It was, nevertheless, a method that required a great deal of skill, developed through practice. After four to six weeks of practice, a newly qualified chick- sexer might be able to determine the sex of 200 chicks in 25 minutes with an accuracy of 95 per cent, rising with years of practice to 1,000–1,400 chicks per hour with an accuracy of 98 per cent."

Or consider remarks in a similar vein by Polanyi (1966:8ff):

"Following the example set by Lazarus and McCleary in 1949, psychologists call the exercise of this faculty [apprehending "the relation between two events, both of which we know, but only one of which we can tell," DLE] a process of "subception." These authors presented a person with a large number of nonsense syllables, and after showing certain of the syllables, they administered an electric shock. Presently, the person showed symptoms of anticipating the shock at the site of "shock syllables"; yet, on questioning, he could not identify them... He had acquired a knowledge similar to that which we have when we know a person by signs which we cannot tell."

Based on this type of case some researchers on the mind likewise have argued that many of our thoughts and actions are heavily influenced by things we do not know we know or do not know how to say or are simply unable to talk about. For example, Freud claimed that much of what guides the workings of the mind is unconscious, while Chomsky refers to the inborn, tacit knowledge of Universal Grammar that all Homo sapiens are born with.

In my own work, I have long referred to the invisible forces that act on our mind as the "Dark Matter of the Mind." Recently I was pleased to read that some psychologists, such as Joel Gold, also use this phrase:

> *"The conscious mind—much like the visible aspect of the universe—is only a small fraction of the mental world. The Dark Matter of the Mind, the unconscious, has the greatest psychic gravity. Disregard the dark matter of the universe and anomalies appear. Ignore the Dark Matter of the Mind and our irrationality is inexplicable."*[3]

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[2] http://science.nasa.gov/astrophysics/focus-areas/what-is-dark-energy/

[3] http://edge.org/response-detail/11095

My view of dark matter is quite different, however, from Freud's, Chomsky's, or Gold's, though there is some overlap. For example, Gold takes the dark matter to be essentially psychological. For me however it is found in the individual, in the individual's nurturing culture, and in the connections between the two.

Dark matter is understood in one way or the other by all who study humans. In fact, in one sense, all of psychology is a sustained attempt to understand the dark matter of the mind. For example, consider the recent research of Susan Carey () on concepts, of Elizabeth Spelke () on a range of inborn knowledge, Alison Gopnik () on children's ability to learn things that may seem innate but are not, just to name a few. One of the pioneers of the study of dark matter, a source we will return to many times in the course of this book, was Edward Sapir (1884-1939), who spent his life researching the connection of individual psychology to cultural patterning. Unfortunately, psychology as it is currently practiced largely ignores that aspect of dark matter which most exercises me, namely, culturally-directed unspoken knowledge alongside the structuring of apperceptions (the ways by which we process, make sense of, and assimilate our experiences), explicit learning, body memory, and so on, to form the individual. The former was addressed perhaps most insightfully by Sapir and the latter by Buddhism (see Flanagan (), and ___ ()).

Philosophers have also written a great deal on tacit knowledge (similar to but not identical to my concept of dark matter), going back at least to the seminal work of Michael Polanyi. A few of the works that deal with tacit knowledge directly range from Searle's () discussion of the "background," to work by John McDowell () and Robert Brandom () on the implicit vs. explicit in concept-formation and others that we discuss in the course of this book.

Let me underscore the caveat that dark matter is not to be confused with tacit knowledge. This will become more important as we proceed. Of course some work in philosophy could be interpreted as making a case that tacit knowledge cannot exist (see Koster 1994 for one discussion). For example, according to Wittgenstein (SOURCE), knowledge is not a representation in the mind that can be either talked about or be ineffable, but it is action – what we "know" is a matter of what we do. I think that this position that knowledge is action has a good deal to commend it, but I also believe that falls short of a full theory for largely failing to recognize the continuity between apperception and memory, on which more below. And it fails to tell us why and how actors act.

In the cognitive sciences more generally the idea of tacit knowledge has been around for a while. The online dictionary of philosophy of mind (https://sites.google.com/site/minddict/knowledge-tacit) is just one of many places where varieties of notions of unspoken knowledge is discussed.

Within my own area of specialization, linguistics, Noam Chomsky, one of the founders of the cognitive sciences and *Generative Linguistics*, was among the first intellectuals to develop the structure, meaning, and importance of dark matter, as he introduced the theories of deep structure and Universal Grammar.[4]

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[4] Often confused, deep structure and universal grammar are not the same. However, the later theory of Generative Semantics did blur this distinction considerably for the lay reader by proposing that deep structure was in fact the same for all languages, what came to be known as the Universal Base Hypothesis.

Nevertheless, although Chomsky has been more influential across a broader swath of intellectual areas, Kenneth Pike's ideas on unspoken knowledge come closer to the dark matter that this essay addresses. Crucial to this study is Pike's notion of *emicization.* Pike coined the terms *emic* vs. *etic*, from the widely used linguistic terms phon*etic* vs. phon*emic*. Phonetics (articulatory, acoustic, or auditory) is the study of speech sounds from the perspective of a non-native speaker, say, a physicist or linguist. Phonemics is the study of the set of phonetic sounds that native speakers perceive as single sounds, i.e. the sounds that are important from the perspective of a native speaker, an insider.[5] For example, English speakers all hear one sound, /p/ in the words [park], [spark], and [carp], when in fact there are at least three sounds, all written as 'p' in these words, namely, [p], [p^h], and [$\bar{p}$], respectively.[6] Native speakers thus know less *explicitly* about the sounds of their language than they tacitly know about them, since speakers in general never perceive the separate etic sounds but only the single emic sound that an etic sound is associated with. Yet they never confuse etic sounds in use. In just the same way, native speakers know how to use all the etic sounds of their language appropriately, e.g. the three separate manifestions (technically, *allophones*) of /p/ in this example: "Use [p] in syllable-medial positions, [p^h] in (some) syllable-initial positions, and [$\bar{p}$] in phrase-final position."

Extending this etic/emic contrast to culture, Pike (1967) makes a case, one that we will draw upon repeatedly throughout this book, that the insider (emic) vs. outsider (etic) perspective on cultural events, perception, and myriad other aspects of human behavior are possible only because of the crucial use of tacit knowledge, as this term will be developed here.

What is needed, and what is attempted in what follows, is a sustained argument in support of the hypothesis that our actions, beliefs, desires, values, and other behavioral or mental markers of the self emerge from the implicit knowledge and apperception that we acquire as members of particular social groups, from our families and tribes to our societies and nations. Unlike Hall's silent language or Searle's *background*, dark matter is multilayered, differentially manifested, and variously derived from the experiences of living.

Our discussion here is a microcosmic culture of its own – an arrangement of knowledge and apperceptions that are not quite like those of any other discussion. From this micro-culture, I hope that answers emerge for several questions of interest to cognitive scientists. Perhaps the broadest question it attempts to answer is how cultures and individuals form one another. This is an old question but still one worth trying to come to grips with. Clearly, if you or I had been born in very different countries by the same parents or to different parents in the same country we would not be "you or I," but quite different people. In the former case I would still be red-headed and pale-skinned, but perhaps I would be taller or shorter, fatter or thinner, stronger or weaker, smarter or dumber, more tolerant or less tolerant, etc. than I currently am. I would likely prefer

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[5] These are both idealizations. Our understanding of "phonetics" seen, for example, in something so erstwhile objective or etic as the International Phonetic Alphabet, is shaped by our emic perspectives and most etic categories are already idealized in cultural ways. So there is no truly objective vantage point, just ones less contaminated in ways we know of.

[6] The standard convention in linguistics is that //s are used to enclose phonemic sounds and []s to enclose phonetic sounds.

different foods, react differently to pain, and different things would disgust me or please me. Most would acknowledges that we would all be different physically, mentally, and morally if raised in another culture. The crucial question is "How different?"

Our investigation of dark matter of the mind sets out to answer the question of what it means to be human from our perspective of apex social primates. It asks whether humans are so constrained by instincts or physics that our freedom is an illusion. It interrogates the very notions of culture, society, and the mind. For some (see the discussion of Tooby in Chapter Two), culture is little more than collection of oddities – a lexicon of cues, values, and bits and pieces of knowledge. To these people, if we strip away this lexicon like some agglomeration of mental barnacles we will find the same cognitive and emotional structures and functions in all humans. I disagree. I push back against the idea that humans are more alike around the world than different. In addressing the issues, many subsidiary questions and problems arise, such as how, if at all, cultural variation interacts with emotions, physical development, morality, death rates, cognition, and so on. Concerns with the cognitive-cultural contribution to a theory of Homo sapiens have been discussed for a long while. Edward Sapir was a pioneer of the study of mind-culture interaction. His premature death in 1939 lead to a decades-long hiatus in such studies.

To review a bit of the post-Sapirian work on cognition it the 1950s there was a partial return to the study of the mind, but now as a computer rather than as part of a larger culture. The date most associated with this new "mental turn" is September 11, 1956. On that day a gathering of researchers at the Massachusetts Institute of Technology focused on the nature of the human mind, an event that Gardner (1987) and others, refer to as the birth of the "cognitive revolution" (Boden (2006) provides the best and most comprehensive history of the cognitive sciences). I believe that this assessment is incorrect for various reasons. It was not a revolution in any sense, however popular that narrative has become. For example, as I just stated, Sapir explicitly studied cognition and culture decades before this conference, no less insightfully than studies introduced in 1956 and subsequent years. Moreover, the "revolution" that emerged from this question asked fundamentally the wrong question, focusing on the mind as a disembodied knower. Nevertheless 1956 was unarguably a watershed year, a rebirth of studies of the mind, at least on the US side of the Atlantic. The personalities and works associated with the 9/11/56 MIT conference were deeply influential in the revival of interest in the mind. The presenters at the conference included George A. Miller, Noam Chomsky, Nobel Prize winner Herbert Simon, Allen Newell, and several others. Many other philosophers, anthropologists, psychologists, computer scientists, and linguists joined the emerging cognitive sciences generously supported by the A.P. Sloan Foundation.

Following the 1956 conference, funding began to emerge for studies of the mental or, in the new buzz phrase, the "cognitive sciences." In the early rounds of funding for the cognitive sciences in the mid 1970s by the Alfred P. Sloan Foundation, grants were awarded to the University of California, San Diego; the University of Texas at Austin; MIT; Yale University; Brown University; and Stanford University. Later grants to further develop efforts were also awarded to Carnegie Mellon University; the University of Pennsylvania; the University of Chicago; the University of California, Berkeley; the University of Rochester; and the Cognitive Neuroscience Institute. In these early awards and efforts by the different institutions (these grants coincided with my entry into

linguistics as a student), there were conflicts over the very definition of cognitive science. What was cognitive science? Was it singular or plural (several cognitive sciences vs. a single cognitive science)? Who was *really* doing cognitive science as it should be done?

My own view is that no one was. In all of this funded research, this new energy, these brilliant ideas, there was nothing in the cognitive sciences that suggested that people were asking serious questions about the context in which the mind is formed – particular individuals situated in particular cultures. Culture was examined as a manifestation of the mind in most cases, even in so-called Cognitive Anthropology. Unfortunately, these studies were in this sense unidirectional, mind --> culture, and they were dramatically myopic in their obsessive focus on computation and the metaphor of the mind as a computer. In retrospect, it seems that because of the newness of the computer at the time, the metaphor that drove the 50s cognitive studies, continuing on to the present, these otherwise superb studies all failed to consider human emotions and the role of the individual as a whole (body, mind, and culture) in cognition, focusing narrowly on what they saw as the "computational" aspects of thinking. Yet emotions (muscles, hormones, even bacteria) and the body, i.e. *the individual* (if one believes as I do that there is nothing to an individual but their body), are the portals to reasoning and cognition. No theory of cognition can hope to succeed without a focus on the entire individual – not merely their "minds" and their place in society. Cognitive scientists never examined in any detail the foundational relationship of culture to the mind, the mind as an outgrowth of culture. The reason for the short-sighted investigations the cognitive sciences have undertaken to date seems to follow from the misleading idea that the mind is a digital computer, an evolved software running presently (but not necessarily) on neurological hardware. This metaphor is fragile though. For example, unlike the brain and body, computer software doesn't grow biologically from its hardware. Nor do computers possess emotions, one of the primary drivers of human cognition. And we cannot overlook the fact that the mind is shaped by its environment even when not attending to its environment, in ways that no inert computer is. These are just a few of the serious shortcomings – or at least I will try to show here that they are – of the digital computer theory of the mind. Thus – from the perspective here – the entire cognitive sciences "revolution" took the wrong road, the wrong "turn," as philosophers occasionally use that term.

I expect that this book may bother some because it makes the case that standard cognitive psychology comes up short in understanding the human mind – for the reasons just given. Although the study of dark matter is vital to understanding how the mind works, all knowledge is itself a product of living culturally – structuring one's life around *ranked* values, experiences, apperceptions, etc. that are learned, though almost never taught, as a member of a society.

The two most visible names associated with tacit knowledge over the past sixty years are Michael Polanyi and Noam Chomsky. They offer different conceptions of the nature and source of this knowledge. The tradition inspired by Polanyi's work focuses on tacit knowledge that is learned, internalized, and forgotten until called upon, such as how to play a song on the guitar or ride a bike. Parallel to this idea of 'learned, internalized knowledge' is the nativist idea, associated most frequently with Chomsky, but in fact running throughout western thought from Plato through Bastian's 'psychic unity of mankind,' that humans share some knowledge because it is programmed into all of us

innately, instincts, moral principles, rules of grammar, and a number of congenital concepts. Other prominent exemplars of purported innate tacit knowledge include Freud's notion of the unconscious, Campbell's idea of the universal mythic structure "Monomyth," Jung's theory of archetypes, and the work of Cosmides, Toobey, Fodor and Pinker what some call 'massive modularity' in evolutionary psychology.[7] The theses of tacit knowledge and nativism of some sort need not be opposed, however. It is possible that both learned and innate forms of tacit knowledge are crucially implicated in human cognition and behavior. What we are genuinely interested in is not a false dichotomy of extremes but in a continuum of possibilities – where do the most important or even the most overlooked contributions to knowledge come from?

I am here particularly concerned with difference, however, rather than sameness among the members of our species. The variability in dark matter from one society to another is fundamental to human survival, arising from and sustaining our species' ecological diversity. The range of possibilities produces a variety of "human natures (cf. Ehrlich ())." Crucial to the perspective here is the concept-apperception continuum. Concepts can always be made explicit. Apperceptions less so. The latter result from a culturally guided experiential memory (whether conscious or unconscious or bodily). Such memories can be not only difficult to talk about but ineffable (see Levinson and ___ (2014). Yet both apperception and conceptual knowledge are uniquely determined by culture, personal history, and physiology, contributing vitally to the formation of the individual psyche and body.

Dark matter emerges from individuals living in cultures and thereby underscores the flexibility of the human brain. Instincts are incompatible with flexibility. Thus special care must be given to evaluating arguments in support of them (see Blumberg () for cogent criticisms of many purported examples of instincts, as well as the abuse of the term in the literature). If we have an instinct to do something one way, this would impede learning to do it another way. For this reason it would surprise me if creatures higher on the mental and cerebral evolutionary scale – you and I, for example – did not have fewer rather than more instincts. Humans, unlike cockroaches and rats – two other highly successful members of the animal kingdom – adapt holistically, not merely physically, to the world in which they live, in the sense that they can learn to solve problems across environmental niches, but teach their solutions and reflect on these solutions. Cultures turn out to be vital to this human adaptational flexibility – so much so that the most important cognitive question becomes not 'what is in the brain?' but 'what is the brain in?' (That is, in what individual, residing in what culture does this particular brain reside?)

The brain, by this view, was designed to be as close to a blank slate as was possible for survival. In other words, in my opinion the views of Aristotle, Sapir, Locke, Hume, and others better fit what we know about the nature of the brain and human evolution than the views of Plato, Bastian, Freud, Chomsky, Tooby, Pinker, and others. Aristotle's *tabula rasa* seems closer to being right than is currently fashionable to suppose, especially when we answer the pointed question, 'What is left in the mind when culture is removed?'

Most of the lessons of this book derive from the idea that our brains (including our emotions) and our cultures are related symbiotically through the individual, and that

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[7] Though others, e.g. Lieberman (2013) refer to this work in less complimentary terms as revived phrenology.

neither supervenes on the other. In this framework, nativist ideas often are superfluous. Of course, I maintain (Everett 2012) that in order to see this we must understand the *platforms* (universal) of human cognition, the *nature of the tasks* humans have to perform, and the ways in which humans *live culturally* and come to acquire the cerebral dark matter that ultimately shapes who they are and how they think about and relate to the world around them. These arguments extend the case for culturally derived tacit knowledge begun in Everett (2012) for language, to a fuller spectrum of cultural and cognitive determinants of individual identity.

The flexibility and cognitive resources of humans are most concentrated in the dark matter. This matter itself emerges from many sources. Culture is but one of those. Emotionally-driven goals are another. Material environment is another. The nature of the task to be performed is another. But the role of culture in domains where it was once considered irrelevant is vital to the understanding of ourselves and our species. So here we want to consider the case that what we do and what we come to know are shaped primarily by the greatest distinctive feature of our species: culture.

To understand what is at stake, let's consider again the phrase "human nature." There are many definitions of human nature. We find them in biology (Wilson ---; Ehrlich ---), in philosophy (Plato ---), in psychology (Freud ---; Pinker ---), in most major religions, in neuroscience (Churchland ---), in ecology (Cashdan ---) , in theology (Calvin ---), and in literature (Twain ---) among other places. For some theists, human nature is the propensity to rebel against God and do wrong, damaged by original sin. In Hinduism all humans are defined by the *atman*, the true soul or essence of the person, which is in need of self-knowledge. In Buddhism there is *anatman*, 'no self,' meaning that there is no essence of an individual human, just the set of experiences they pass through, their apperceptive histories (or in Buddhist terms, the *skandhas*: form; sensation; perception; mental formations; and consciousness.).

Human communities produce unseen forces that shape the way we live, including the ways we think, communicate, make moral judgments, conduct science, and find happiness, through the activity some anthropologists refer to as "culturing" – acting in a community, constrained by others' values and concepts. The forces that shape us are variously known as values, implicit information, culture, background, and so on. But these forces are more occult and powerful than the average description of them might lead us to believe. It is these forces that I intend by "dark matter." Although my concept of dark matter is related to Michael Polanyi's tacit knowledge or "personal knowledge," Polanyi's focus was unlike mine in that it was not so much on culture as on subroutines and components of large intentional acts (e.g. to ride a bike we need to first learn to keep our balance on the bike, learn to pedal, learn to brake, and so on – subroutines that are ultimately forgotten (but still present) in the single mature intention of "ride a bike"). This dark matter, on the other hand – to slightly paraphrase George Harrison's eponymous song – is "within us and without us," at once embodied in individual humans at the same time that it serves as the unseen connective force between members of a given society. It includes our tacit collective intentions to maintain cultural values and knowledge that is binds cultures together. If correct, this view presents a challenge to the past sixty years of study in the cognitive sciences, because these sciences have failed to account for the nature, origins, and effects of this dark cultural matter on the formation of human identity.

For example, some evolutionary psychologists appeal to specific ranges of predispositions to define innate human nature. A common example of such dispositions emerges from research that suggests that many humans react to risky behavior as "sexy." But reactions to risky behavior are not uniform across all types of risk. According to the relevant research (Wilke et. al. 2006), the kind of risky behavior that is most likely to attract, say, women to men involves risk that is part of the evolutionary history of the human brain. So a female human could be "turned on" by a man washing windows on a skyscraper or a man swimming in deep water because deep water and high places are part of the primeval fears that evolved in our species, perhaps the entire Homo genus. If this were correct then we would all share a biologically determined attraction to people who show evolutionary superiority over primordial risks. And for this very reason, a woman would not be aroused by the sight of Homer Simpson working in a nuclear factory, because radioactivity was not part of her species' evolutionary development, even though radioactivity is much more dangerous than heights (radioactivity can kill many more). In this view, there is a human nature that is formed by the sum of our evolutionary predispositions, which may go by various names, one of the most common being innate "mental modules," or simply "the innate mind" (Carruthers, Laurence, and Stich 2005, 2006, 2007).

Dark Matter of the Mind examines and rejects this view. As a glimpse of why, consider an example of dark matter that is often overlooked by psychologists and anthropologists, perhaps because it is thought to be too obvious – cultural knowledge. So imagine that you are walking in the Amazon rain forest, accompanied by someone raised there; someone who has survived because of their understanding of the local flora and fauna. As you make your way through the humid green growth of the climax forest, out of the corner of your eye you notice a branch move. You walking partner notices it at the same time. What you have both seen can in principle be measured – the speed of the branch in motion, the distance from the resting state that the branch moved, how high off the ground the branch is, the branch's color, whether fruits or nuts are growing on the branch and so on. What is measurable is external to both of you. It is both epistemically and ontologically objective (Searle ()).

On the other hand your interpretation of this movement is internal and cannot be measured. It is ontologically subjective. But – at least from the perspective of the local – the experience is epistemically objective. Thus it can be studied, even though it is an ontologically subjective experience (Searle --). Although you may have no interpretation of what you saw at all, other than "the branch moved," perhaps you wonder why the branch moved or maybe you think it was moved by an animal, by the wind, or by a falling object. You lack a specific hypothesis or knowledge about the cause behind the movement of the branch. This is understandable. Your perception and your interpretation both suffer from a lack of background knowledge. Did you notice whether other tree branches on the same or different trees were also moving? Did you notice what direction from you (north, south, east or west; downriver, upriver; uphill, downhill; etc) the tree sat in relation to your vantage point? Did you notice the species of the tree whose branch was moving? Perhaps you did. Likely not, though. On the other hand, your companion very probably does have an interpretation of what you both just saw based upon an automatic and tacit environmental hermeneutics. And this interpretation and its foundations can be studied to some degree, meeting the condition of epistemic objectivity (Searle --).

Your companion can tell you immediately whether the wind moved the branch (were other branches moving at the same time on other trees) or whether an animal or falling fruit caused the movement. He or she knows what animals live in that species of tree, whether they are likely to be found around the position of that branch (in the case of a very tall tree, such as a Brazil nut tree), whether they are eating, hiding, hunting, etc. Your companion's tacit knowledge, like yours of your native environment, is hard-won and largely independent of explicit instruction.

As another example, imagine that you are teaching your daughter how to pilot a motorboat in a switchback river. You are both sitting back at the transom; she has her hand on the control arm. You tell her that she has to anticipate the turns by beginning to turn ever so slightly towards them. Never wait until the last second, never turn abruptly. And yet as you approach turns, you find that the rear end of the boat begins to come around faster than it should, moving you sideways down the river, threatening to capsize. You forgot to tell her that movements must be even slower the lower the boat sits in the water or when the weight is distributed unevenly in the boat. Some of what you know can be easily spoken. But there is a "feel" to the actions you are explaining for which you cannot find words. Is this "feel" of the action something you *know*? Is it related to knowledge or something completely different? To some this is like asking whether one "knows" how to like lemons.

Many philosophers, going back to Socrates, refer to knowledge as "warranted true belief." In most cultures, therefore, taste is not considered knowledge – because it isn't "true" an objective sense and because it has no external warrant – you like what you like. Thus my enjoyment of Mexican food is not best characterized as warranted true belief. But if taste is not knowledge in our culture, we need to ask what it is. Perhaps it is related to intuition. But then we need, as we attempt here, to try to come to grips by what we mean by intuition. If we say that knowledge is using concepts and accept Robert Brandom's () concept of concepts, then nothing is known conceptually unless we can make it explicit. Some things that shape us cognitively, however, such as taste, cannot be made explicit. This is one reason that we describe so many exotic meats with the phrase "tastes like chicken," even when we know they don't in fact taste like chicken. We just have no other comparator in our apperception set, nor word in our vocabulary.

A recent article on the difficulties of expressing tacit knowledge about food is found in the popular press, where one author asserts that:

> *"The English language doesn't offer a specific vocabulary for describing food aromas. Despite the fact that smell is the dominant force in flavour perception, English speakers refer to aromas by the names of the foods they are most commonly associated with. Aniseed, citrus or nutty, for instance."*
> (http://www.theguardian.com/lifeandstyle/wordofmouth/2014/jun/03/what-does-meat-taste-of-flavours, June 03, 2014)

This is because perception follows at times from either knowledge or apperception and we do not expect to find words for all cases from the latter source. Some apperceptions are ineffable. If this is correct, then we may indeed encounter common human experiences for which no culture has words.

Our experience and appreciate of taste is an aggregate of sorted apperceptions, as well as the biology of taste sensors. How we come to have taste experiences and how these ultimately give us our sense of what we like to eat, contributing to our very sense of

"self" and personality illustrates what we are trying to get at here. In other words, self is largely a memory of skandhar (apperceptions) that forms the self or "nonself" (the anatman) as these are ordered and selectively recalled/stored by our episodic and short-term memories.

Interestingly, however, among the Pirahãs of the Brazilian Amazon, taste *does* seem to be classified as a kind of knowledge. Thus when they offer a stranger food, they ask "Do you know how to eat this?" If it looks unappealing, one can simply reply "I do not know how to eat this." No one loses face and your inability is chalked up to an experientially-based ignorance.

One way to build the case for dark matter would be to construct our understanding of the former via an exploration of our knowledge of language. By this tack we can build on what is known about our most significant and largest set of intuitions and expert knowledge to offer an account of intuitions and expert and tacit knowledges across domains. This is not a new approach. Claude Lévi-Strauss used linguistic principles learned from Ferdinand de Saussure and Roman Jakobson, to invent "structuralist anthropology," while Marvin Harris, Clifford Geertz, and others appealed to Pike's concepts of etic vs. emic to construct very different approaches to the study of culture. Sapir, Boas, and the early American anthropologists of course saw linguistics as one branch of anthropology, so it is not surprising that there would be some mutual influence of thinking about culture on thinking about language and vice-versa, though history for some reason shows a fairly unidirectional flow during a period of time, from language to culture. In *Language: The Cultural Tool*, I attempted to show new ways in which cultural reflection might influence linguistic theorizing as cultural values affect and effect some linguistic structures.

Kenneth L. Pike provided anthropologists and linguistics with the basic conceptual opposition that has affected both the study of culture and the study of language profoundly. Pike's etic vs. emic dichotomy is crucial throughout the present study. As Pike (1967, 37) put it: "The etic approach treats all cultures or languages – or a selected group of them – at one time. It might well be called 'comparative' in the anthropological sense (cf. M. Mead, 1952: 344) were it not for the fact that the phrase 'comparative linguistics' has a quite different usage already current in linguistic circles... The emic approach is, on the contrary, culturally specific, applied to one language or culture at a time." But the etic-emic relationship is a difficult empirical issue. As Pike () puts it, "Regardless of how much training one has... emic units of a language must be determined during the analysis of that language; *they must be discovered, not predicted* [emphasis mine, DLE] – even though the range of kinds of components of language has restrictions placed upon it by the physiology of the human organism..."

In a sense then, we are engaged here in an exploration of how the "emic" in each of us shapes our language, our culture, and our construction of personal identity. It argues for "emicization" – the process of constructing an insider point of view, particularly the source of the "dark matter" of the mind that makes us and our societies who and what they are. Dark matter is then emicization via aggregated apperceptions (personal interpretations of experiences), acquired concepts, and their cultural-internal interpretations. It is a function of the body (there is a sense in which my fingers know how to play the guitar) and culture.

In my sense "mind" is an oblique reference, largely inaccurate, to the individual's capability to know and arrange what they know. I take the peculiar view that knowledge is not merely a state of mind, but stored and created at least in part by actions, experiences, memory, relationships, and orientations.

By "culture" I roughly mean (see chapter two) what we know, our values, and the systematicization of our values, knowledge and apperceptions *as members of a given society*. In other words, culture is societal systematicization, the hypernymization of terms; connection of facts to individual roles, and cultural objectives. Cultural systematicization often brings recursive, hierarchical structure to knowledge across all the mental dimensions just mentioned. It is not necessarily all our knowledge. But it is the major *arrangement of our knowledge and values.*

This all gets us to the primary thesis or point of this entire work: there is no useful notion of "human nature." Rather than "human nature" people are controlled by dark matter, acquired and shaped via culture, biology, and individual psychology. This leads to a replacement of the idea of human nature with the alternative concept of "personal nexus."

Authors as varied as Garfinkel (), Pike (), Boas (), Rogers (), Read (), Mead (), Silverstein (), Tomasello (), Parsons (), Churchland (), White (), and Prinz (), among many others, have written on related topics, of course. So let me point out what I believe to be the novelty of this book. It is a new, linguistically-inspired synthesis of philosophy, psychology, anthropology, and linguistics to understand the self without nativist incantations. It is the proposal that tacit knowledge and the construction of the cultural-psychological-physical nexus just is what we know as "self." There is no human nature if by this we mean a kind of a priori knowledge common to all and only humans.

The chapters each build a distinct layer of the story. In the first four chapters, Part I, I lay out the three foundational components of my model of dark matter: culture-as-values, values-as-emicization, and culture-as-grammar. This begins in chapter one with a definition and discussion of the nature of dark matter, and its pedigree in two principal lines, the Platonic and the Aristotelian. In chapter two, we lay out a novel, ranked-value theory of culture. To do this we examine a number of historic and well-known definitions of culture offered over the past 100 or so years, concluding that all are inadequate and offering a simpler, yet more comprehensive and satisfying definition of culture that immediately incorporates the idea that it is the source and object of dark matter. Chapter three lays out a set of scenarios and principles by which culture and dark matter are acquired, focusing especially on the development of concentric circles of attachment in the Amazonian society of the Pirahãs. Chapter four examines the fundamental contribution of dark matter to our interpretation of the world around us and our ability to navigate through it.

In part two, beginning with chapter five, we look at communication, gestures, the enlargement of the mind through culture, and the role of dark matter of the mind in translation individuals, situations, languages, and other components of the world we can see only etically. In chapter five's discussion of the complexity of communication, the focus is on discourse and how it is constructed by and imbued with dark matter, tacit information reflecting cultural values, knowledge, and roles. Chapter six examines the role of gestures in bringing culture and grammar together, while simultaneously providing a separate level of organization that, in conjunction with prosody, serves as a

necessary complement to what is normally seen as the grammar behind the utterances of language. Later we examine perception of two-dimensional surfaces in Pirahã and discuss the implications of our finding that the Pirahãs have a difficult time extrapolating three-dimensional objects from two-dimensional surfaces. This is a cultural fact, illustrating ways in which dark matter can either shrink or expand our minds. In chapter eight we consider this theme in the realm of translation, looking closely at how dark matter enables us to reinterpret texts, individuals and other entities external to our culture in our own terms. In other words, we look at how we use etic observations to construct emic representations.

Moving on to Part Three, we discuss the implications of the theory developed to this point for two issues of fundamental and urgent importance for understanding human psychology and human evolution. In chapter nine it is argued that there is nothing like instincts or modules in our higher-level cognitive abilities, e.g. language, interpretative principles of the world around us, Bastian's elementary ideas, Freud's tripartite mind, Campbell's monomyth, and so on. The final chapter argues that human nature is reducible to an understanding of our bodies, our memories, our intelligence, and our apperceptions. There is beyond these matters no "psychic unity of mankind" no single human nature.

CHAPTER TWO: THE RANKED-VALUE THEORY OF CULTURE

Dark matter is not simply another word for culture. But there is a clear connection between the individual, their community, and the formation of the dark matter of the individual mind. Like language, "culture" is an abstract noun, and we can never expect to find a "culture" or a "language" in the real world. Rather, what we find are people – people speaking and acting with one another. Their mutually-shaping activities of "languaging" and "culturing" build similar values, concepts, social roles, linguistic constructions and so on in each of them. Language is both action and knowledge simultaneously. And so it is with culture as well.

For example, consider the following interactions between two linguists:

A. "Colorless green ideas sleep furiously."

B. "They sure do."

The general population has no idea what A's utterance means. But A&B know that this is a famous example sentence in Chomsky's early writings that is designed to show that a sentence can be grammatical yet meaningless. For the two linguists, A's sentence is an insider joke and B's response a humorous rejoinder. The function of the exchange might be largely phatic, simply to say "Hey, we are both linguists." But additionally B's reply shows that A's utterance is not meaningless, because it indicates that whatever green ideas are, the sure sleep intensely.

Now consider the following. Persons C and D are watching the New England Patriots play the Miami Dolphins. The Patriots take the lead. C and D both yell "Yes!" and "high five" one another. In this joint action they show knowledge that there is a game of football, knowledge of how this game is scored, shared value-ranking for the Patriots relative to the Dolphins, knowledge of what "high fives" are like and what they are for, knowledge that they are both "rooting" for the same team, and reinforcement of all of the above.

From such activities come knowledge-how, knowledge-that, community belonging, shared communication, and so forth – various forms of dark matter elicited, strengthened, and formed by very simply paired actions. These exemplify the role of culturing and languaging as dark matter and as forming dark matter.

In chapter one we traced the different historical sources of theories of dark matter – a priori and a posteriori tacit knowledges. The chapter made the case that there are two major traditions forming the major epistemological divide in approaches to the tacit. The Platonic tradition holds that humans are born knowing things. The principal contemporary proponent of this Platonist line is Noam Chomsky, who has spent the last 60 years or so developing the theory of Universal Grammar, the idea that all humans are born with innate linguistic knowledge.

On the other side, there is the Aristotelian tradition in which knowledge is learned, facilitated by human capacities. This tradition ranges across the centuries to Sapir, the present work, and many others.

I want to begin this section of the larger exposition with a claim that some might find startling or simply wrong. In the study of cultures and languages, the methods of linguistics are by and large superior to those of modern anthropology. Thus not only is linguistics a branch of anthropology, but it is the model branch for studies of ethnography.

With this axiological preliminary, I plan to continue our discussion by developing a theory of culture based on the Aristotelian conception of tacit knowledge, arguing at the same time that tacit knowledge is too narrow as normally conceived and thus that it must be replaced by my idea of dark matter.

A historical incident, the famous Treaty of Medicine Lodge Creek, signed in 1867 between the Arapaho, Kiowa, and Comanche peoples and the US Government at the Medicine Lodge River of Kansas, frames the first part of our discussion here. This treaty is worth examining not for what it contained, but for the readings it was given based on the dark matters of the opposing sides signing the treaty. After discussing various levels of implicit knowledge and perspectives on each side and the breakdown in communication that thereby resulted, we are prepared to review several influential definitions of culture entertained by anthropologists down through the years. We then take up the desiderata for a definition of culture and offer a novel proposal based primarily on knowledge structures, ranked values, and social roles. Again, culture is not dark matter. But living culturally – in a community with shared culture in my definition – forms a good deal of every individual's dark matter.

From the discussion of culture, we explore various applications of this theory and how it elucidates and harmonizes concepts that some have taken to be orthogonal or contradictory to one another. We conclude the chapter with a discussion of the applications of the theory of culture to modern business as one example.

Key to the entire theory is the linguistic anthropological concept of emicization (Pike 1967), which describes the trajectory and point of all linguistic and cultural learning – the achivement of the perspective of the insider.

Because dark matter is constructed by actions, observations, conversations and the other components of a life history in a particular society, to understand it we must understand what this abstract notion of culture is that plays such a significant role in its emergence.

For more than a century, anthropologists have bickered about the definition of culture. Some have even argued that it should be replaced with a less global, monolithic notion. But no anthropologist has seriously entertained the idea that it can be tossed out and replaced by nothing. The reason for this is that the members of a given family, community, society, nation and so on clearly share some knowledge, some values, and relationships between their different sorts of knowledge and the rankings of their various values. They clearly talk alike. They clearly act in similar ways. They show disgust at similar things. And so on. In what follows I want to examine the evidence for culture, how it contributes to the dark matter of the mind, and then to consider one influential critic's arguments against it.

Let's say that you wanted to convince someone else that culture exists. What facts might you appeal to in order to support the existence of an entity called culture? Well, you might suggest social roles, or values, or knowledge-transmission and learning, or skills and ways of being. And any of these that can be explained by other means lose their force as arguments for culture.

I am a father, a teacher, an administrator, a husband, a shopper, a patient, and a counselor, among many other roles. Each one of these is arguably shaped or entirely formed by cultures to which I belong. Culture distinguishes and forms roles, even when they may seem universal, and thus potentially culture-independent. For example, though

it is true that there are Italian fathers and American fathers, "father" should not be equated across cultures. It seems likely that between any two cultures, fathers will have overlapping but never identical roles. There are crucial differences between fathers of different cultures. Even American fathers or any fathers of ostensibly the same cultures vary in the nature of their roles at different times.

For example, some societies may believe (more accurately, "value the idea that") fathers support their families. In such a society, it may be assumed that fathers have a responsibility to provide food, clothing, and shelter for their children. And, in western societies at least, both the society and many fathers themselves believe that it is good for fathers to help their children with schoolwork, heavy lifting, and tasks in general too difficult for children to do alone. Fathers of other generations may share exactly these beliefs and values. But of course these values are not identical across different cultures. For example a Pirahã father will not pick up a child to comfort them if the child has injured itself, except in rare circumstances. He will expect the child to work hard and not complain on long treks through the jungle and will not offer assistance in many cases that the American father would. And these individual values are also the values of the society as a whole.

But even in different generations within the same culture or social group, fathers may nonetheless differ profoundly. For example, values of my father's generation included corporeal punishment, the expectation that women did the bulk or all of the housework, the belief that their wishes and orders would be carried out without question, and the attitude that their children were not deserving of respect or of a voice in family affairs. These fathers might regularly side with teachers against their own children in disputes. They considered the child and all its resources as mere extensions of themselves and thus their possessions. The fathers of the generation of my children, on the other hand, usually avoid corporeal punishment, see their family as a unit of equals, know they ought not to believe that their desires should be the only or even the main one heard, often help clean the house, would likely take their children's side in a school dispute, and so on. Being a father in the 1950s was therefore considerably different than being a father in the 21st century ("considerably" does not mean "entirely" of course). This is because the cultural role is constrained and defined by shifting cultural values.

If such an explanation is on the right track, i.e. if there are definable group values and role-expectations, then there is evidence that values are shared across individuals and therefore may partially define a group. This is in turn (part of) what it means for a group to be a culture – shared values. All cultural roles show similar diachronic, geographic, economic, and other shifts across time or across space or across populations. If we move from roles to beliefs or from beliefs to shared concepts, to shared phenotypes, shared food, shared music, and so on, we can find many examples of shared tacit knowledge that produce overlapping cultural groupings.[8]

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[8] A list of definitions and descriptions of culture, not all of which we will explore is the following (from http://varenne.tc.columbia.edu/hv/clt/and/culture_def.html):

*Franz Boas (The mind of primitive man 1911): "*Culture may be defined as the totality of the mental and physical reactions and activities that characterize the behavior of individuals composing a social group collectively and individually in relations to their natural environment, to other groups, to members of the group itself and of each individual to himself. It also includes the products of these activities and their role in the life of the groups. The mere enumerations of these various aspects of

life, however, does not constitute culture. It is more, for its elements are not independent, they have a structure (p. 149)."

*Ruth Benedict (1934): "*What really binds men together is their culture, -- the ideas and the standards they have in common. (p. 16)"

*Margaret Mead (1937): "*Culture means the whole complex of traditional behavior which has been developed by the human race and is successively learned by each generation. A culture is less precise. It can mean the forms of traditional behavior which are characteristics of a given society, or of a group of societies, or of a certain race, or of a certain area, or of a certain period of time. (p.17)"

Max Weber (1904): "We have designated as "cultural sciences" those disciplines which analyze the phenomena of life in terms of their cultural significance. The significance of a configuration of cultural phenomena and the basis of this significance cannot however be derived and rendered intelligible by a system of analytical laws (Gesetzesbegriffen), however perfect it may be, since the significance of cultural events presupposes a value_orientation towards these events. The concept of culture is a value_concept. Empirical reality becomes "culture" to us because and insofar as we relate it to value ideas. It includes those segments and only those segments of reality which have become significant to us because of this value_relevance. Only a small portion of existing concrete reality is colored by our value_conditioned interest and it alone is significant to us. It is significant because it reveals relationships which are important to us due to their connection with our values." (p.76); "The focus of attention on reality under the guidance of values which lend it significance and the selection and ordering of the phenomena which are thus affected in the light of their cultural significance is entirely different from the analysis of reality in terms of laws and general concepts." (p.77) (from *The methodology of the social sciences*. New York: The Free Press. 1949)

*Kroeber and Kluckhohn (1952): "*Culture consists of patterns, explicit and implicit, of and for behavior acquired and transmitted by symbols, constituting the distinctive achievement of human groups, including their embodiment in artifacts; the essential core of culture consists of traditional (i.e. historically derived and selected) ideas and especially their attached values; culture systems may, on the one hand, be considered as products of action, on the other as conditioning elements of further action." (p. 357)

*Talcott Parsons and Edward Shils (1951): "*Culture has been distinguished from the other elements of action by the fact that it is intrinsically transmissible from one action system to another [by learning and by diffusion]." (p. 159) "[...] A complex external symbol structure [...] can bring about roughly the same type to orientation in any or all of the actors who happen to orient to it." (p. 160); "The consistency of pattern of such a system will exist to the extent to which the same combination of value judgments [...] runs consistently throught the actors' responses to different situations." (p. 172)

*Claude Levi-Strauss (1949): "*Man is a biological being as well as a social individual. Among the responses which he gives to external stimuli, some are the full product of his nature, and others of his condition... But it is not always easy to distinguish between the two... Culture is neither simply juxtaposed to nor simply superposed over life. In a way, culture substitutes itself to life, in another way culture uses and transforms life to realise a synthesis of a higher order." (1969 [1949]: 4)

*Gregory Bateson (1960): "*If I kick a stone, the movement of the stone is energized by the act, but if I kick a dog, the behavior of the dog may be indeed partially conservative--he may travel along a Newtonian trajectory if kicked hard enough, but this is mere physics. What is important is that he may exhibity responses which are energized not by the kick but by his metabolism; he may turn and bite. (p. 229) [...] ... it is all a matter of the sort of modifications which could be expected among systems whose determinants are not a matter of physics in the crude sense, but a matter of messages and modulated systems of messages." (p. 233)

*John Dewey (1916): "*Social efficiency as an educational purpose should mean cultivation of power to join freely and fully in shared and common activities. This is impossible without culture, while it brings a reward in culture, because one cannot share in intercourse with others without learning--without getting a broader point of view and perceiving things of which one would

otherwise be ignorant. And there is perhaps no better definition of culture than that it is the capacity for constantly expanding the range and accuracy of one's perception of meanings. (p.123)

*James Baldwin (1955): "*Culture was not a community basket weaving project, nor yet an act of God; being nothing more or less than the recorded and visible effects on a body of people of the vicissutes which which they had been forced to deal." (p. 140)

*Antonio Gramsci (1932): "*One might say 'ideology' here, but on condition that the word is used in its highest sense of a conception of the world that is implicitly manifest in art, in law, in economic activity and in all manifestations of individual and collective life."

*Lionel Trilling (1955): "*When we look at a people in the degree of abstraction which the idea of culture implies, we cannot but be touched and impressed by what we see, we cannot help being awed by something mysterious at work, some crative power which seems to transcend any particular act or habit or quality that may be observed. To make a coherent life, to confront the terrors of the outer and the inner world, to establish the ritual and art, the pieties and duties which make possible the life of the group and the individual--these are culture, and to contemplate these various enterprises which constitute a culture is inevitably moving. (p. 91-2) [...] [Freud] does indeed see the self as formed by its culture. But he also sees the self as set against the culture, struggling against it, having been from the first reluctant to enter it. Freud would have understood what Hegel meant by speaking of the 'terrible principle of culture.'" (p. 93)

*Michel Foucault (1971): "*un système d'exclusion (système historique, modifiable, institutionellement contraignant)" (p. 16)

Raymond Williams (1981): "[...] if culture is the 'whole way of life' there can be a crucial absence of significant relational terms beyond it. In practice, in most anthropology, the general relational terms are 'culture' and 'nature', and there are some simple societies in which these are reasonably explanatory... But in highly developed and complex societies there are [...] many levels of social and material transformation... It is indeed in the area of these complex transformations that the signifying system is itself developed and must be analyzed." (p. 210)

*Ward Goodenough (1971): "*The term culture [refers to] what is learned, ... the things one needs to know in order to meet the standards of others." (p. 19) "Therefore, if culture is learned, its ultimate locus must in individuals rather than in groups. If we accept this, then cultural theory must explain in what sense we can speak of culture as being shared or as the property of groups at all, and it must explain what the processes are by which 'sharing' arises." (p. 20)

*Milton Singer (1968): "*Most characteristic [of recent work on culture] is a shift away from a theory of discrete culture traits within a framework of universal cultural history or cultural evolution to a study of the functions, patterns, and structures of cultural forms within a plurality of organized contexts... The definition of culture in terms of learned behavior ... seemed at first to promise a unified theory to social and mental culture. But with the failure of behavioristic learning theories to account for the differentiated processes and kinds of learning involved in the acquisition of language, kinship systems, and other aspects of culture, this promise has not been fulfilled." "Taken as a working hypothesis the cognitive conception of culture offers a promising program of research, the results of which should improve cross-cultural understanding. Taken as a definition of the nature of man or as a general theory of human culture, however, it seems just as narrow and one-sided as previous definitions and theories." (p. 540)

Clifford Geertz (1966): "[the culture concept] denotes an historically transmitted pattern of meanings embodied in symbols, a system of inherited conceptions expressed in symbolic forms by means of which men communicate, perpetuate, and develop their knowledge about and attitudes toward life... (p.89) [...] The point is sometimes put in the form of an argument that cultural patterns are "models," that they are sets of symbols whose relations to one another "model" relations among entities, processes ... The term "model" has, however, two senses -- and "of" sense and a "for" sense... Unlike genes, and other nonsymbolic information sources, which are only models for, not models of, culture patterns have an intrinsic double aspect: they give meaning, that is, objective conceptual form, to social and psychological reality both by shaping themselves to it and by shaping

In part these shared mental items emerge because over the course of one's life, each of us accumulates experiences, lessons – both formal and informal, and relationships all being assimilated into our bodies and minds, partially via apperception.

People that grow up in the same community (a relative term that in my usage can refer to family, village, nation, and so on) have similar experiences – climate, television, food, laws, and values (e.g. fat is wrong, honest is right, hardwork is godly, etc). Their experiences are subjected to apperception and memory, both muscle and mental memory (setting aside the important question of whether there is any fact any such distinction). Episodic and muscle memories hold our various experiences together as culture-guided apperception makes them our own. Arguably our "self" or at least our "sense of self" is no more than this accumulation of memories and apperceptions.

This is then in broad-brush how dark matter of the mind is formed. We want to go deeper, however, by exploring the roles of attachment and emicization in the emergence of dark matter and how this dark matter forms the bedrock of culture and individual psychology.

There have been many definitions of culture offered in the anthropological literature over the years. While we discuss several of these in what follows, I want to begin with my own definition just to set the stage:

> *Culture is an abstract network shaping and connecting social roles, hierarchically structured knowledge domains, and ranked values. Culture is dynamic, shifting, reinterpreted moment by moment. Culture is only found in the bodies* (the brain is part of the body) *and behaviors of its members.*

From this definition it follows that: *people may share cultural components without being part of an independently defined social group*.

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it to themselves." (p. 93)

David Schneider (1968): "... a cultural system; that is, a system of symbols." (p. 1)

*James Boon (1972): '"*Culture' pertains to operations which render complex human phenomena com- municable... What we might call the experience-as-conceived (or let us simply say the communication) of those phenomena is achieved by some sort of selection (implies reduction) and emphasis of some of the elements from each of the orders adduced. And these elements are themselves connected in a more or less traditional arrangement --i.e. in an arrangement which implicitly refers back to tradition either by being like it or unlike it. Most generally, some sort of selection of elements from posited orders which are evidenced in the phenomena, communicates the phenomena (or in effect is the communi- cation of the phenomena) in complex conscious and/or unconscious ways to persons enacting the phenomena themselves... In sum, communicable experience is achieved through the process of selecting and inter-retaling sets of elements from various orders of phenomena... This process we might call simply the operation of the analytically posited orders." (p. 227)

Richard Shweder (1991): "It is a presupposition of cultural psychology that when people live in the world differently, it may be that they live in different worlds. (p. 23)
Psyche refers to the intentional person. Culture refers to the intentional world. Initen- tional persons and intentional worlds are interdependent things that get dialectically constituted and reconstituted throught the intentional activities and practices that are their products, yet make them up... Culture is the constituted scheme of things for intending persons (p. 101)

*Bruno Latour: '"*the set of elements that appear to be tied together when, and only when, we try to deny a claim or to shake an association." (1987:201)

Although this definition emerges from a theory of culture, it also interrogates the construction of such a theory. What should, for example, a "theory of culture" do exactly? Well, it should enable us to understand. It should remove or radically lessen our surprises regarding human social behavior and indexical values. It should predict or at least explain a range of behaviors. A theory of culture should explain individuals' behaviors in specific cultural contexts. It should offer an understanding of the major institutions of a society. It should provide a guide and methodology for investigating specific cultures. To see what I mean, let's begin with an example from American history.

In October 1867 a meeting took place at Medicine Lodge Creek, near present-day Wichita, Kansas, that led to one of the many treaties between the US government and the aboriginal peoples of North America. On the one side were representatives of the US Peace Commission. On the other there assembled members of the Comanche, Cheyenne, Arapaho, Kiowa, and Apache peoples. There were displays and speeches from both sides of the conference. The American military made a showy display with of colorful uniforms, howitzers, and other weaponry. The Indians gave a lesson in horsemanship that no US mounted soldiers could match. Chief Ten Bears of the Yamparika Comanches made an impassioned speech. The treaty was signed. All agreed to it.

But the treaty was ineffective from the beginning. For once at least an official treaty with the Indians was invalidated not because of dishonesty on the part of the US government but because the signatories failed to realize that language, whether spoken or written in treaties, is merely the visible portion of an invisible universe of understanding that derives from the values, knowledge, and experiences – the cultures – of individual communities. Though people might read the same words in a treaty, as in all communication our interpretations are slaves to our assumptions, based on background beliefs and knowledge that the literal meaning of the words rarely conveys.

In this case, the treaty called for the US government to provide food to the Indians so that they could feed their families through the winter months. The US Indian agency was responsible for providing the food. The US Congress was responsible for ratifying the treaty that was signed. Each in turn depended on other cultural institutions, all with their own deadlines and priorities. The Indians could not have cared less about ratification, etc. But they should have. Because when they arrived to collect their provisions, prior to ratification of the treaty, the pantry was bare. The Indians felt betrayed.

On the other side, the US government expected that the Indians, when the agreed to live in the reservations, would consider themselves bound to stay there in perpetuity and to forever abide by the "law." Perpetual obligations to anyone other than their own families were foreign to the Indians' values and understanding of the way the world worked. They could never have legitimately made the commitment expected of them. It made no sense. Although the US government could not have cared less about Indian interpretations rooted in their very different cultures, it should have. Comanche chief Quanah Parker, present at this ill-fated gathering, at least learned from the experience. In his future dealings with whites he learned to respect the importance of the dark matter of the unsaid. He subsequently inquired about every potential assumption that he thought whites might be making before signing future treaties (though no one outside a culture can ask all the right questions).

There are plenty of examples of such dark matter of culture in everyday, mundane transactions. For example, when you tell your friend "Well, we're going to eat now," depending on your relationship, but only a little on your words, this could mean "It is time for you to go home therefore" or "It is time for you to wash up and sit with us." The interpretation will be based on your relationship, your knowledge of one another's culture and personal expectations, your monitoring of the looks of other family members and so on. It will not be based merely or even mainly on the words that your potential host speaks.

The point is that human language is not just a computer code. Fortran is not a language. Languages and human cognitive abilities draw on and emerge from cultures. Nothing in human language or human societies can be understood without getting at the dark matter of the background. This is what makes the study of human behavior more difficult than the so-called hard sciences – the variables of human interactions are not only nearly infinite, but the majority are hidden from direct observation. Understanding the nature and role of this dark matter in human behavior, language, and thinking is essential for comprehending, co-existing, and working together with fellow humans.

In spite of such obvious (though still superficial) evidence for culture, there are culture-deniers. For example, in an essay addressing a question posed on the website Edge.org, namely, "What scientific idea is ready for retirement?" John Tooby, a founder of so-called "Evolutionary Psychology," argued that "culture" is a term that has not been found useful and should be abandoned. He argues that "...'culture' and the related term 'learning' are ... a pair of deeply-established, infectiously misleading, yet (seemingly) self-evidently true theories." He claims that "All 'culture' means is that some information states in one person's brain somehow cause, by mechanisms unexplained, 'similar' information states to be reconstructed in another's brain."

Tooby's concern is frankly hard to take seriously. For example, according to his caricaturization, screaming "fire" in a crowded theory would be an example of culture. Moreover by his description language would just *be* culture, equating two important, distinct concepts, since language is the primary means for getting ideas from one mind to another. Yet it presupposes ideas shared in both individuals for it to work at all. The contents of a movie would just be "culture" according to Tooby, because everyone watching the movie would share information if they understood the movie, regardless of when or where they watched it or what society they belonged to.[9] A poster of an equation becomes "culture" just in case the equation is solved or even understood roughly by a driver passing by, at any time, in any place, from any language.

Tooby further claims that a "science" of culture is no less gibberish than a science of how one building affects its neighbor building through architecture, power lines, etc. Instead of culture, Tooby argues that we instead need to isolate specific phenomena, such as "ritual" or a conversation and break it into its specific components and study those. Analyzing material into its constituent parts is nearly always a worthwhile endeavor for a scientist, depending on the level of analytic detail needed to answer their questions. To claim that we can dispense with an overarching concept of culture in favor of its

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[9] It is trivially true that if you can understand a movie, you must understand something of the culture that produced it, but this doesn't mean that you are a member of that culture. Not even momentarily. And it is not obvious that a serious film *can* be understood well by those outside the culture. (CITE SONTAG)

constituents is to repeat the errors of the Chomskyan paradigm in linguistics that ignores conversation, discourses, and texts in favor of the exclusive study of sentences. Tooby claims that culture is no more helpful a concept than "protoplasm" (though comparing it to the "ether" would have been more powerful and humorous). "Culture and learning are black boxes, imputed with impossible properties, and masquerading as explanations... They are the La Brea tarpits of the social and behavioral sciences." The history of science shows us that failure to consider phenomena in the proper scale leads to misunderstanding.

If a famous scientist like Tooby is unconvinced of the usefulness of the term "culture," then either it is indeed useless, he has read insufficiently, he has a vested interest in opposing the concept, or there is a need for a clearer understanding/definition of culture. I believe that there is indeed a need for a clearer or more accurate definition of culture. Yet this need not mean justify discarding the concept as useless, as Tooby urges upon us.

Some of the reasons for Tooby's apparent bemusement with the concept culture are the following. First, Tooby is committed to his own model of Evolutionary Psychology, which we consider in more detail in chapter ___ below. Evolutionary Psychology is by and large incompatible with the idea that there is a force, culture, in which the mind is shaped and through which it learns things, for if this were true it would render unnecessary Tooby's nativist theory of how cognition works, focused as he is on the mind instead of the individual, and on "what's in the mind," rather than "what's the mind in." Second, this bemusement arises from a disregard of more than a century of anthropological studies that conclude that culture is a powerful explanan for human cognition, behavior, and social relationships, among many other things. Tooby's comments do not merely fail to refer to this literature. That is not the problem at all in fact, especially not in a piece designed to be a short, pithy popular essay of the Edge type. More significant is that the remarks show ignorance and disdain for this literature, describing a concept that has not ever been more than a small aspect of culture (modes and types of information transfer). Nevertheless, Tooby can support his remarks by the accurate claim that there is no universally-embraced definition of culture among anthropologists.

Culture has often been appealed to by scholars as a way of understanding commonality within groups. For example, in his book, *The Embarrassment of Riches: An Interpretation of Dutch Culture in the Golden Age*, Simon Schama discusses the Dutch motto, *Luctor et Emergo*, "I struggle and emerge," and its role in capturing the Dutch people's struggle to hold back and reclaim land from the sea – to build a nation where once there was only water and providing a natural rallying cry, a summary (to some) of their most important cultural values.

What are we to make of this phrase? Obviously, legislators often have the authority declare any phrase the state motto, any flower the state flower, any song the state song. This doesn't mean that such a phrase reflects a cultural value. Nor does this automatically give it purchase in the society. On the other hand, Schama makes the case that not only does Lector et Emergo capture a fact about Dutch history and the personalities of some Dutch aristocrats, but that such phrases can create the very cultural value they name. The question Schama's book and many others raise is what the significance might be of intentionally shared ideas and values, through such means as

advertising, public proclamations, slogans, flags, and so on for effecting cognitive change within groups. When the cognition is shared or causally linked, leading to shared actions, this gets us part way to what we mean when we claim that a people forms a specific culture (or "lives culturally").

On the one hand, Tooby is absolutely right that to have meaning "culture" must be implemented in individual minds. Of course, this requirement has long been insisted on by careful students of culture such as Sapir (SOURCE). Yet Tooby has no account of how individual minds, like ants in a colony or neurons in a brain or cells in a body, can form a real entity from their cognitive commonalities, their community of knowledge, values, and roles. His own nativist views offer little insight into the unique "unconscious patterning of society" (to paraphrase Sapir) that establishes the "social set" to which individuals belong.

The idea of culture, after all, is just that certain patterns of being – eating, sleeping, thinking, posture, and so forth have been *cultivated* and that minds arising from one such "field" will not be like minds cultivated in another "field." The Dutch individual will be unlike the Belgian, the British, the Japanese, or the Navajo, because of the way that their minds have been cultivated – because of the roles they play in a particular value grouping, because of the ranking of values that they have come to share, etc.

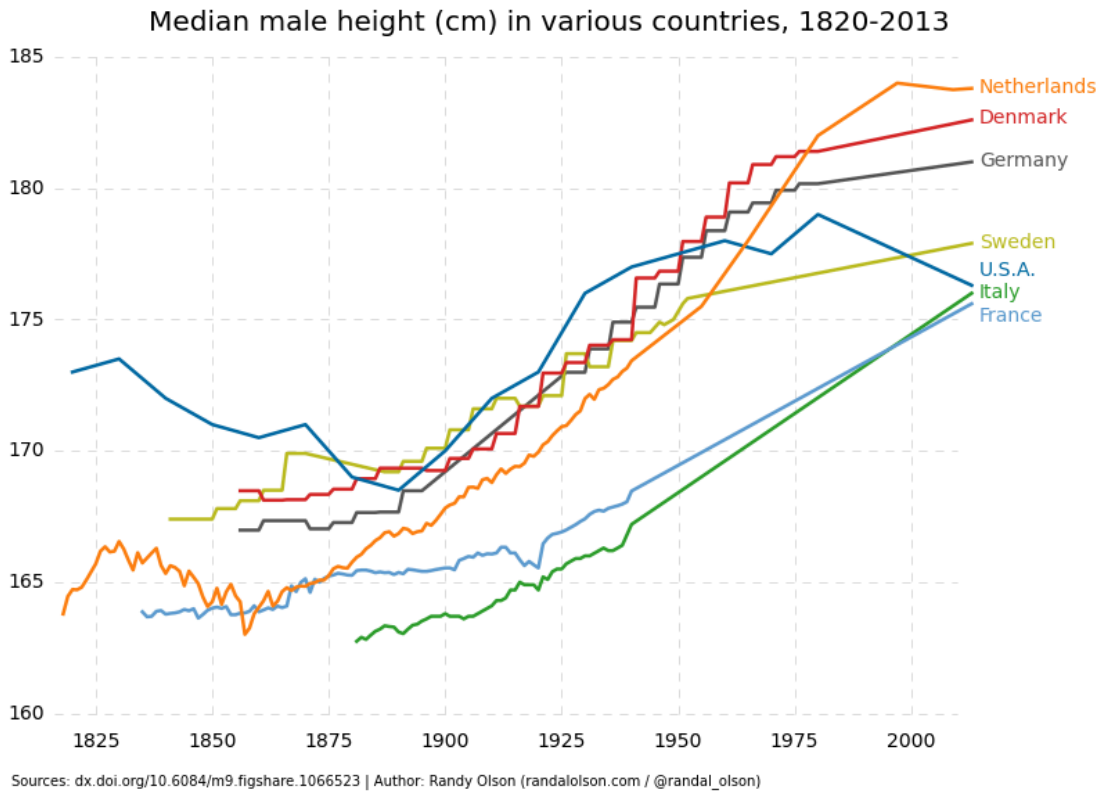
We must be clear of course that the idea of "cultivation" we are speaking of here is not merely of minds, but of entire individuals – their minds *and* their bodies. From the earliest work on ethnography in the US, for example, Boas showed how cultures affect even body shape. And body shape is a good indication that the body and the mind are both cultural products. Likewise, the uses, experiences, emotions, senses, and social engagements of our bodies shape our minds.

Denying the importance – or even the very existence – of culture as an object of study in favor of its constituents would be like a linguist studying only phonemes, rather than words, or words rather than sentences, or sentences, rather than stories, or stories rather than conversations. Looking only at the parts and never at the whole leads to a defective understanding of all in this case. Saying that culture is just one person's mind affecting the mind of another person is like saying that language is just one person's voice's affect on another person's ear, or that somehow the acoustics of speech transmission are the only proper object of study for linguistics. We should not forget that language is no less difficult to pin down definitionally than culture. Yet we cannot do without this notion. People share a language, even though we know that no two people speak exactly alike. On the one hand, language is an abstraction, just as culture is. Moreover, language, like culture, is a property of individual speakers, not the group as a whole. Yet this does not make language, or culture, one whit less real as a shared possession of multiple people simultaneously. Anthropologists may have an even less sanguine view of culture as existing in the minds of individuals, but here is a place where I believe linguistics offers a better model.

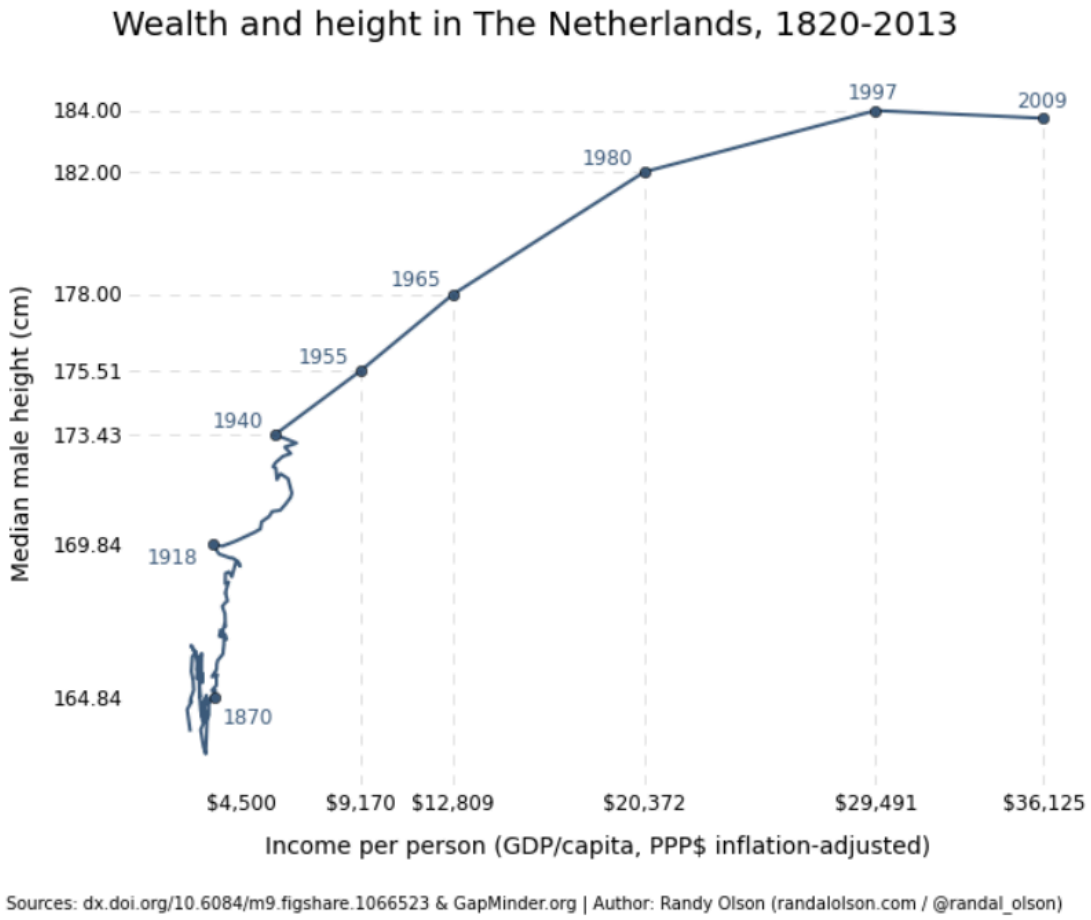
Sticking with the idea that understanding language can help us to understand culture, consider how linguists account for the rise of languages, dialects, and all other local variants of speech via the linguists' truism that "you talk like who you talk with." And, I aruge, this principle actually encompasses all human behavior. We not only talk like who we talk with, but we also eat like who we eat with, think like those we think with, etc. We take on a wide range of shared attributes – our associations shape how we

live and behave and appear – our phenotype. Culture can affect our gestures and many other aspects of our talk. Boas (1912), in a series of works, takes up the issue of environment, culture and bodily form. He provides extensive evidence that human body phenotypes are highly plastic and subject to non-genetic local environmental (whether dietary, climatological, or social) forces. Had Boas lived later, he might have studied a very clear case, namely, the body height of Dutch citizens before and after World War II. This example is worth a close look because it shows that bodies, like behaviors and beliefs are cultural products and shapers simultaneously.

I am fascinated by the curious case of the Netherlanders. The Dutch went from among the shortest peoples of Europe to the tallest in the world in just over one century. The Dutch growth in height is correlated, according to Layzell (2008), with the change in political system: "The Dutch growth spurt of the mid-19th century coincided with the establishment of the first liberal democracy. Before this time, the Netherlands had grown rich off its colonies but the wealth had stayed in the hands of the elite. After this time, the wealth began to trickle down to all levels of society, the average income went up and so did the height." There were, to be sure, other factors, especially diet, among other Europeans, including Dutch genes, that help explain European heights relative to the Dutch. But democracy, a new political change from strengthened and enforced cultural values, is suggested as a crucial component of the change in the average height of the Dutch, even though the Dutch genotype has remained relatively constant. For example, consider the charts below from: http://www.randalolson.com/2014/06/23/why-the-dutch-are-so-tall/



In 1825, US male median height was roughly ten centimeters (roughly four inches) taller than the average Dutch. In the 1850s, the median heights of most males in Europe and the USA were lowered. But then around 1900 they begin to rise again. Dutch male median height lagged behind that of most of the world until the late 50s and early 60s, in which it began to rise at a faster rate than all other nations represented in the chart. By 1975 The Dutch were taller than Americans. Today, the median Dutch male height (183 cm or roughly just above 6 feet) is approximately 3 inches more than the median American male height (177 cm or roughly 5'10"). This height change is, again, largely a cultural phenomenon. But it is also a biological phenomenon. To see this consider the next chart:



In this chart the correlation between wealth and height emerges clearly. As wealth grew so did men (and women). This wasn't matched in the US, however, even though wealth also grew in the US (precise figures are unnecessary). What emerges from this is that Dutch genes must underlie the Dutch height transformation, from below average to the tallest people in the world, but the genes had to await the right cultural conditions before they could be so dramatically expressed.

Like the Dutch or any other culture's, Pirahã phenotype is also subject to change. Facial features among the Pirahãs range from slightly Negroid to East Asian, to American Indian. Pirahã women have had trysts with various visitors (mainly river traders and their crews, but also government workers and contract employees on health assistance

assignments, demarcating the Pirahã reservation and so on). One sizeable group of current Pirahãs (perhaps 30-40) are descendants of the Torá, a Chapakuran-speaking group that emigrated to the Maici-Marmelos rivers as long as two hundred years ago. Even today Brazilians refer to this group as Torá, though the Pirahãs refer to them as Pirahãs. They are culturally and linguistically fully integrated into the Pirahãs. Their facial features are somewhat different – broader noses, some with epicanthic folds, large foreheads – giving an overall impression of similarity to Cambodian features. This and other evidence show us that the Pirahã gene pool is not closed.[10] Yet body dimensions across all Pirahãs are constant. Men's waists are uniformly 38cm, their average height is 157.5 cm, and their average weight 55 kilos.

What drew my attention to this fact is that over the past several decades, I have had many occasions to take Pirahã men, women, and children to have Pirahã measured for western clothes as I took them Brazilian towns for medical help or to simply visit at my home for a few weeks, teaching me their language as they also get to know Brazilian culture a bit better. The Pirahãs always ask that I purchase Brazilian clothes for them so that they will not attract unnecessary stares and comments. All measurements for men were the same, as given in the preceding paragraph.

Getting back to our earlier observation, all studies of culture and human social behavior can be summed up in the sociolinguist's slogan that "you talk like who you talk with." We unconsciously (sporadically – we may be conscious of this initially) learn the pronunciation, grammatical patterns, lexicon and conversational styles of those we talk with the most. If you live in Southern California, for example, you are likely to say "My car needs washing" or "My car needs to be washed." But in Pittsburgh, you are more likely to say "My car needs washed" or "My car needs to be washed." There is a grammatical contrast between the two dialects in that one (Southern Californian) requires the present participle form of the verb for the adjectival construction whereas the Pittsburghese dialect requires the past-tense form of the participle. Both cultures converge in the "to be" construction. If you talk mainly to people of my generation, on the other hand, you will likely say something like "He bought it for you and me," whereas a member of a more recent generation would tend to say "He bought it for you and I."

The question is whether there is any more to the idea of culture that this sociolinguistic principle of "local mimicry." If not, we do not need a theory of culture per se, but only a theory of mimicry. And were this the case, Tooby's criticism might well be correct. Yet though there are good theories of mimicry (Boyd & Richerson (); Arbib (); among others), culture is far more than mimicry.

Although mimicry (joint influence to be more precise) is the entry point to culture, along with emotions, and basic survival needs of our species, the structures and values constitutive of culture take time to evolve. These structures and values emerge partially through conversational interactions, which are form-meaning exchanges, including the content of speech, perspectives on right and wrong, acceptable levels of

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[10] Obviously DNA studies would be interesting and necessary scientifically before saying anything confident on this score, but it is difficult politically to carry out such studies because in Brazil those delegated to protect indigenous peoples are wary of anything that could be perceived as racist studies, especially studies carried out by "gringo" scientists.

novelty of information or form of presentation, and levels and markers of conformity. This happens as people talk like who they talk with.

In other words, people grow to be alike. Raise two children together and they will be more alike than had they been raised apart. They will share values that children raised apart do not share and they will, at least early on, share knowledge structures that are more similar than had they been raised apart. The more people talk together, the more they talk alike. The more they eat together, the more they eat the same foods in the same way – the more they eat alike. The more they think together, the more they think alike. And so on.

We examined the end results of such developmental conformity in the previous chapter. In this chapter we want to consider how such conformity comes about in the first place. We begin with an example that underscores the tacit values and knowledge in our lives.

Culture has meant many things to different people over the years. This is telling. The diversity of views indicates that culture is not an easy concept to define – not a run-of-the-mill concrete noun like 'book,' 'relative,' 'taco' or 'tomato.' Rather it is an abstract noun like 'love,' 'ambition,' or 'edification.' There is no (near-)universal consensus on what culture is. In fact, this lack of consensus has led some (e.g. Tooby (2014)) to declare the notion dead and of no use to science or the more general understanding of Homo sapiens. My own view is that culture has been hard to define not only because it is an abstraction, but also because it is a cover term for "sets of sets" of things united within a community. To better understand the definition of culture that I want to propose in this chapter, it will be helpful to first survey some of the better-known definitions from the anthropological literature.

Perhaps the best known of all definitions of culture is that offered by Edward Tylor in 1871: "Culture, or civilization, taken in its broad, ethnographic sense, is that complex whole which includes knowledge, belief, art, morals, law, custom, and any other capabilities and habits acquired by man as a member of society. Tylor (1920 [1871], 1).

Although Tylor's definition of culture is well-known and still used by some, it is far from adequate. It isn't a bad point of departure to begin a discussion on the nature of culture, but it falls considerably short of a full definition. On the one hand it is too coarse-grained. It doesn't allude to, for example, the relationships between kinds of knowledge that, almost as much as the knowledge itself, defines a culture. It has no reference to roles that people play in their cultures nor the variety of relationships in which different roles may emerge. These are important research topics in contemporary anthropologically oriented research so a definition of culture should make the concepts accessible/expected. Yet the most critical shortcoming of Tylor's definition, aside from its failure to refer to roles, is its lack of mention of meaning and hierarchy. Culture is how we structure our knowledge and how we get meaning from the world, among other things, and so is much more than merely what we know as part of a group.

The late Talcott Parsons (SOURCE) offered a different definition of culture: "Culture consists in those patterns relative to behavior and the products of human action which may be inherited, that is, passed on from generation to generation independently of the biological genes." Well, of course culture must be heritable. But this is far from all it is. For example, a Filipino-American boy could acquire some patterns from his American father and pass these down to his children, but continue to mainly interact with Filipinos.

By Parsons's definition the boy would be culturally American and Filipino, yet the set of things inherited by the boy from his father too small a set for any one to treat him like or mistake him for an American. There has to be more than merely inherited knowledge. So, like Tylor's definition, Parsons's is not incorrect, but neither is it necessary or sufficient. We have just seen that it is insufficient. But it is also not necessary that information be inherited. For example, one people could view another people as "the enemy" during wartime and share this attitude and knowledge of the other people. But the attitude might not (hopefully would not) be passed down to a subsequent generation after the particular war. The knowledge was cultural knowledge, but it was not unnecessary that it be inherited to count as such.

Another leading anthropologist to offer a definition of culture is Ward Goodenough (SOURCE): "A society's culture consists of whatever it is one has to know or believe in order to operate in a manner acceptable to its members." Again, one can say, "Yes, of course," but still be unsatisfied with this definition for the same reasons as previous definitions – its lack of reference to structure, roles, hierarchy of knowledge, and so on.

The French anthropologist, Claude Levi-Strauss, offered the following: "Man is a biological being as well as a social individual. Among the responses which he gives to external stimuli, some are the full product of his nature, and others of his condition... But it is not always easy to distinguish between the two... Culture is neither simply juxtaposed to nor simply superposed over life. In a way, culture substitutes itself to life, in another way culture uses and transforms life to realise a synthesis of a higher order." (1969 [1949]: 4) "Nature" and "condition" refer to biology and culture or genotype vs. phenotype, respectively. Culture, as Levi-Strauss puts it "substitutes" for life, i.e. it buffers us from our biology as it offers us a way to live that is not merely biological. It changes our lives from those of mere animals living in proximity, to a society, with values and the other components of mental and social life. The words of Levi-Strauss here are merely a description of some aspect of culture, not a definition. Still he offers insights that any theory of culture should provide.

Clifford Geertz offers a definition of culture that surpasses the previous ones, in my opinion, by focusing on meaning: "[M]an 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 interpretative one in search of meaning…. Once human behavior is seen as . . . symbolic action -- the question … to ask [of actions] is what their import is. Geertz's definition of culture as "webs of meaning" is partly correct. Surely, as I argue myself in chapter ___, meaning is a vital component of human life that culture furnishes. But meaning is not all there is to culture. Culture also establishes constraints, a variety of socially-vital roles, and values, as well as conventions, symbols, and many if not all of the *forms* used to encode and decode meaning.

In spite of its shortcomings, however, Geertz's definition is particularly interesting to me because it is the first to talk of culture as a way of getting meaning from the world. Yet it places too much emphasis on the symbolic. It ignores, for example, the "grammar of culture" that Pike proposed and that in some form *must* be part of our understanding of culture. And grammar itself, although it manipulates symbols, is not itself necessarily symbolic. Yet without a grammar we cannot extract meaning from the world around us.

Finally, let's examine Marvin Harris's definition of culture (Harris 2001, 47ff): *"Culture... refers to the learned repertory of thoughts and actions exhibited by the members of social groups – repertories transmissible independently of genetic heredity from one generation to the next."* Again, however, this definition falls short. It seems to make culture little more than what we know and can teach. But it is much, much more than this. In fact, taken literally, Harris's concept of culture lacks an adequate role for dark matter. As we see in this chapter, culture is defined *primarily* through tacit information or dark matter.

Another feature absent from previous definitions of culture is its dynamicity, its refusal to remain static and fixed, its variability even within individual members of the culture, where members' values, roles, and symbols fluctuate frequently.

Let's reconsider more carefully now the definition of culture that was proposed above: "*Culture is an abstract network shaping and connecting social roles, hierarchically structured knowledge domains, and ranked values. Culture is dynamic, shifting, reinterpreted moment-by-moment. Culture permeates the individual, the community, behaviors, and thinking.*"

From this definition it follows that culture is a relative concept and that people can share culture to a greater or lesser degree, even if they are not members of a well-defined social group or community or geographical area. There are various components to this definition, each subject to a range of (mis)interpretations, so let me unpack it before applying it.

By "abstract network" I mean that culture is a postulate to help explain what it is that people share when we say that they are members of a particular society. Culture resides exclusively in individuals, though its artifacts, rituals, tools, and so on provide concrete evidence for it. And no two individuals are exactly alike. My next door neighbor and I may share many similarities, but we are never identical. Yet we are part of a network – people who have some overlapping values or social roles or knowledge structure or all three.

The more our values, roles, and knowledge structures overlap the more connections we share and, therefore, the stronger is our connection in a cultural network. Thus we can form a generational network, a CEO network, a rap-lovers network, a "Western culture" network, and industrialized society network, and even a Homo sapiens network, so long as we share values, knowledge structures (not merely knowledge), or roles, however slight the overlap.

This is recognized by many lay people when they claim that "people are all alike." We *do* all share some values. And the other extreme, represented by cultural relativists, is also right when it claims that no two cultures are alike – no two cultures (or even individuals) share all the same values, all the same social roles, or all the same knowledge structures.

Values are the attributions by adjectives of morality for the most part (more discussion of values will come directly) to actions, entities, thoughts, tools, people, and so on. They are also statements about how things should or should not be. To say "he is a good man" expresses a value. This can be broken down into finer-grained values such as "he treats his children well" or "he likes stray animals" or "he gave me a ride home" or "he is polite" etc. Values are also seen in the tools we choose – a bat instead of a gun for home defense or a machete instead of a hoe for digging vegetables in the garden. They

are seen in the use of our time. Value sets are vast and varied. We will return to them below.

"Hierarchical knowledge structures" refers to the idea that human knowledge, at least – perhaps this also applies to other animals – is not an unordered set of ideas or skills. What we know is broken down in various ways according to context. All relates to all.

Consider playing the guitar. I say "I know how to play the guitar." I do not describe what I know as "I know where to find the frets as I need them." Take my knowledge of a specific song, such as the ability to play the peerless classic, "Louie Louie." If you ask me if I know it, I will say yes. If you ask me to perform it, I will. And in this exchange we treat it as a unitary item. But if I were to teach you how to play it, it would be of little use to say "Here is Louie Louie" and just run through the entire song, than to explain its component parts: "Start with a G-chord. Hit it three times. Then play a C-chord, likewise striking it three times. Finally form a D-minor chord also hitting it three times. Then repeat as many times as you like, in 4/4 time, singing a number of lyrics. Next I might show you the melody, the lead guitar part, the drum part, and so on. And each of this subparts is also broken down into component parts. All arranged hierarchically, just like the stories and sentences we utter.

I learned the chords, guitar lead, words and so on in small bits. Then I learned to play them together, very gradually, without thinking of them consciously. The song as a whole is not tacit knowledge. But its component parts become tacit after they are learned. They were not originally tacit knowledge. But then they undergo the transmogrification from overt to covert knowledge, illustrating the effects of emicization (taking on the insider's perspective of guitar-playing) on access to knowledge.

"Social roles" describes actions as conforming to a particular node I am said to occupy in an abstract network. Any grouping of people will be defined by its values, the knowledge structures it devolves from and develops, and the expected duties of each of its members by virtue of their membership classification. Whether the group is a college department faculty (each is expected to specialize and their specialization is their role, e.g. syntactician, Amazonianist, chairperson, administrator, and so on).

Department chairs in the North American academic system, China, or the United Kingdom will differ in many of their values, administrative knowledge, and more, but in their roles (independent of what they are called), they share culturally. Moreover, when there exist larger homogenizing forces in the community, they will grow even more alike. An example of such forces in modern academics are international accrediting bodies, such as the AACSB (Association to Advance Collegiate Schools of Business) or EQUIS (European Quality Improvement System) for business schools.

No two individuals will share all values, identical value-rankings, the same set of acknowledged social roles, etc. And each individual will regularly update or modify their knowledge, the concepts of social roles, their values, and their rankings. This dynamicity is another reason we say that culture is an abstraction – it is a generalization with considerable "smoothing."

In order to better understand the model of culture I am suggesting, let's consider how it might solve a problem proposed by Marvin Harris (1999:23ff):

> *"Much evidence exists that the cultural information stored in the brain contains contradictory information. For example, in a study of how Americans*

conceptualize the family, Janet Keller (1992:61-2) recorded these competing 'schema':
Family members should strive for the good of the whole group."
but
The good of the individual takes precedence over the good of the whole group.
Family is permanent
but
Family is always in transition
...
Family is nurturant
but
Family is smothering."

From such "contradictions," Harris (1999, p22) concludes "Indeed, from my cultural-materialist perspective, the emphasis on the proposition that ideas guide behavior, but not the reverse, is the mother-error of contemporary anthropological theories."

Although my remarks here are not intended as a criticism of Harris's overall theory, they do indicate that his arguments in this regard have no force. Everyone appears to hold mutually-inconsistent values. But the inconsistency is not always real. For example, consider the last contradiction above, "Family is nurturant/family is smothering."

Most people would talk about their family in a similar way but not as a contradiction, saying instead something like, "Families are often nurturing/should be nurturing, but unfortunately they are often smothering." "Nurturing" and "smothering" express value judgments. But because they are values, in my model we need to know how they are ranked. And we know that ranked values can be violated by higher-ranked values. Getting back to the terms at hand, the idea of nurturing includes widespread positive judgments in society as a label for a set of more finely-grained values, such as {love, assistance, sharing of wisdom, independence, imposition of limits, trust, financial support, judgment, etc.} Ironically, smothering can follow from the same values, different ranked:

NURTURING (rough pass): TRUST >> SUPPORT >> LOVE >> ASSISTANCE >> SHARING OF WISDOM >> IMPOSITION OF LIMITS >> JUDGMENT

SMOTHERING: LOVE >> JUDGMENT >> IMPOSING LIMITS >> SHARING OF WISDOM >> SUPPORT >> ETC.

The '>>' follows from the use of this symbol in Optimality Theory (Prince and Smolensky 1993) and means that any value to the right of the double arrow can be violated in order to obey a value to the left of the double arrow.

There are many different rankings possible for any set of values. And rankings can vary from individual to individual and even from situation to situation for the same individual or group. A family can thus contain nurturing and smothering values simultaneously (since in my analysis they are the same values) with the difference being in how the values are ranked for a given family member relative to a particular act (work or play) or person (son or daughter for example) involved. Rankings and roles lead to seeming contradictions but, contra Harris, many ideas, once broken down into their component, violable value hierarchies are not contradictory at all. (Of course some ideas

may turn out to be mutually contradictory, e.g. "the earth is flat, but I think I can sail around it" but we cannot say this without careful analysis.) It turns out that people are rational and that the notion that ideas control much of behavior makes a good deal of sense.

The same goes for all the other examples Harris uses. For example, he lists considerations in selection of a location for defecation for Hindu farmers in India (p24):

"A spot must be found not too far from the house.
The spot must provide protection against being seen.
It must offer an opportunity to see any one approaching.
It should be near a source of water for washing.
It should be upwind of unpleasant odors.
It must not be in a field with growing crops."

Harris then observes, "Fulfilling all of these rules on a small farm leads to behavior that violates the rule of fecal avoidance, as evidence by the elevated incidence of hookworm."

Again, Harris cites this seeming set of contradictions as evidence against an idea-over-behavior understanding of culture. His own view of culture (p19) is that "... a culture is the socially learned ways of living found in human societies and that it embraces all aspects of social life, including both thought and behavior."

But neither his criticism, nor his definition of culture get us to the conceptual place I think we need to arrive at. First, the criticism doesn't follow. Assume that the Hindu farmer's desiderata for dump-taking are in fact ranked, violable values. Assume that "avoid fecal matter" is not the highest ranked of the values (outranked perhaps by "stay close to home"). Then the ranked values approach accounts easily for the behavior, sans contradiction, in spite of what Harris claims. It also simultaneously shows his definition of culture to be underarticulated and thus inadequate. This is not to claim that all behavior is value or idea-driven. For example, a baby's grasping may be gene-driven (though this is not at all clear). But most behaviors probably are once we have a theory of violable value-ranking. The same transition from *inviolable,* contradictory rules and constraints to violable, ranked constraints ("linguistic values" in my terms) is what has made Optimality Theory so influential among linguists – it solves the apparently intractable. Neither linguistic ranking and the violable value-ranking I am proposing here are original to the humanities. Ultimately they derive from "Hopfield Nets/Networks" (Hopfield 1982), which in turn emerged from the desire to understand why some physical states were achieved rather than others (why does molten glass dry "smooth as glass" for example). With this brief introduction to my violable value-ranking model of culture, we can consider in more detail just what values are.

Values, as I have stated, are fundamental to culture in various ways. They shape cultural forms, group intentions, meanings, aspirations, conventions, and so on. Before discussing their role in a more depth, however, it is important to understand what a value is. There are several kinds of values and each has an important role in society and culture, though there are a couple of broad sources. The first kind of value to mention are "terminal values." Terminal values include "leading a comfortable life," "having a sense of accomplishment," (see Rokeach 1973, p160ff), "freedom," "security," and so on – they are what society and the individual sanction as laudable goals. "Instrumental values," on

the other hand, are how we think it is best to achieve our goals, e.g. "ambition," "cleanliness," "honesty," "politeness," "self-control," and so on.

There are also what I refer to as "biological values." These are likely shared in one form or another by all humans, though that is an empirical hypothesis. These include things like self-preservation, not going hungry, being warm, and health, among other things. To the degree that these are universal, they are less interesting for the present discussion. But they are definitely part of our dark matter, more connected with emotions and bodily functions than higher cognition, perhaps. Their satisfaction is essential to our well-being, however, and they can override all other values in some circumstances. So it is well to remember them. At the same time, cultures rank and interpret these differently, so comparison is not trivial.

Another set of values is what some researchers refer to as "immanent values," values that hold universally by virtue of their very nature. "Thou shalt not kill," "Thou shalt not commit adultery," "Treat the weaker fairly," and so forth. It is far from clear whether such values actually exist, however. There is little more said about them here, however, because they largely open a discussion of axiology that is orthogonal to our current objectives of understanding how dark matter arises and comes to guide our actions and thoughts.

This is enough to get our discussion of values, culture, and dark matter underway. But for values and value-ranking to be of utility in the anthropological enterprise, we need to say how they might be studied, i.e. the methodological requirements for a study of values. The first methodological question that arises is how one goes about identifying the values of individuals and groups. One obvious way, is to follow the method employed by the famous Rimrock study headed by Clyde Kluckhohn and his wife, Florence.

In 1948 the Laboratory of Social Relations at Harvard University planned and undertook ground-breaking research entitled the "Comparative Study of Values in Five Cultures," or more familiarly known among those close to the research as the "values study." The site of the study was one of the most austerely beautiful regions of the United States, Rimrock, New Mexico, where Clyde Kluckhohn, the nominal leader of this project, had conducted research among the Navajos since 1936. The values study emerged from his (and others') "Value Orientation Theory." This Harvard research group launched a pioneering series of studies of human values, completing the values study in spite of Kluckhohn's sudden death in 1960 at age 55.

In the Harvard study, the research team examined five separate cultures in the Rimrock area, cultures of particular interest because they shared the same environment but with significantly different ways of life. It was hypothesized that since the material environment was identifical, differences in the ways of life would derive exclusively from cultural differences, in particular to differing value systems. The five cultures were Navajo, Zuni, Mexican-American, Texan & Oklahoman farmers and ranchers, and Mormon, based on study of a Mormon village in the same area.

Klukhohn prepared a statement on the project that included the following (Vogt & Albert 1966, p1): "There is general agreement among thoughtful people today that the problem of 'values' is of crucial importance, both practically and from the point of view of scientific theory."

Following the publication of Vogt and Albert 1966, however, the study of values in anthropology eventually petered out. According to D'Andrade's (1995, 13ff)

assessment "... the results [of the Harvard Rimrock study, DLE] were generally agreed to be disappointing. The major problem seems to have involved the *identification* of values. If a universal framework was used, like Florence Kluckhohn's universal framework for the analysis of values, specific cultural values were left undescribed and unanalyzed. But no procedures had been developed to determine specific values." D'Andrade's criticisms are cogent and appropriate. They reflect an earlier evaluation of the Harvard work on values by Edmunson 1973.

The problem, as D'Andrade and Edmunson describe it, is reminiscent of the criticism of Chomsky's research program in linguistics. For example, there is no good treatment in that theory for either (i) the nonoverlap of supposedly universal principles in either abstract or concrete structures of specific languages (e.g. no two "passives" work exactly alike) and (ii) there are no real universals at any interesting level (see Evans and Levinson ()). Universalist theories of socially affected cognition and behavior or linguistics always run aground on the reefs of the details.

Gallagher (2001) summarizes the Rimrock study in the following (this citation is quite long, but all of the material cited is directly relevant to my program here, as becomes clear quickly):

> *"In the 1940s, anthropologists Florence and Clyde Kluckhohn and Frederick Strodtbeck, with the Harvard Values Project, began an exploration of the fundamental values held by different cultures. They hypothesized that "...there are a limited number of common human problems for which all societies at all times must find some solution...How a group is predisposed to understand, give meaning to, and solve these common problems is an outward manifestation of its innermost values, its window on the world: its value orientation." The five common human problems, posed as questions, that provided the most useful "value orientations" in creating a cultural typology were:*
> *What is the temporal focus of life? (Time orientation)*
> - *What is the modality of human activity? (Activity orientation)*
> - *What is the modality of a person's relationship to others in the group? (Relations orientation)*
> - *What is the relationship of people to nature? (Person-nature orientation)*
> - *What is the character of innate human nature? (Human nature orientation)*
>
> *Their "Rimrock Study" in the American Southwest compared a Mexican American village, a Navaho Indian band, a Zuni pueblo, a Mormon community, and a Texan community. From their research they deduced that societies would respond in one of three ways to each of the five questions or orientations (figure 1). (A complete review of this research was published by Vogt and Albert in 1996.)*
> *Figure 1*

ORIENTATIONS	POSSIBLE DIMENSIONS		
Time	Past	Present	Future
Activity	Doing	Becoming	Being
Relations	Individual	Collateral	Lineal
Person-Nature	Humans dominant	Harmony with	Nature Dominant
Human Nature	Good	Mixed	Evil

The "value orientations" chosen by the team recognized that the responses were not values per se, but the foundation assumptions or orientations upon which a culture builds it value system. For example, a society that has a preferred "past" time orientation might express a high value for traditional ways, drawing on the past for its present values, and quite probably valuing elders who carry that knowledge. Conversely, a society with a preferred "future" orientation would more likely draw its values from what will serve to shape the future and would more likely value planning future options.

The paragraph that follows immediately below is interesting in that it shows that the Harvard group had grasped the idea of value rankings, though not necessarily the concept of violable, ranked values.

> *In 1961, Kluckhohn and Strodtbeck published their theory and findings in their book, Variations in Value Orientations, in which they proposed that the rank-order of preference -- from most to least -- gave the society its cultural character. The different patterns of rankings allowed one culture to be distinguished from other cultures. It was this rank-order of preferences, they argued, that was the foundation for the more-visible cultural values, beliefs, norms, and actions -- and even heroes, rituals, songs, etc. -- of the society. They also proposed that, although a society may have a general preference that is dominant, there is a great deal of diversity within cultures and all cultures will express all possible dimensions at some time or through some individuals. Carter (1990) added to these propositions with his finding that cultures could share the same rank order of dimensions, but differ substantially if there was relative difference of preference for each of the dimensions.*

Numerous researchers (see D'Andrade () for a detailed criticism and review) have criticized the Kluckhohns' study for conflating values into an artificial set of "orientations." Rokeach's body of work addresses, in my opinion, many of those shortcomings, however, and could serve as a useful basis for a typological comparison of values. The said, however, there is no reason to suppose that all values, nor even most,

apart from 'biological values' will be universal. And in fact perhaps not even all biological values are, once reinterpreted culturally. The Rimrock study failed, if this is even a useful judgment, because of a failure to sufficiently articulate its theory of value-ranking and, most importantly, for its unwarranted assumption (shared ironically with the much more contemporary theory of Optimality Theory) that values are universal. Yet the study has rightly been seen as pioneering. Perhaps it was partially because of this study that even philosophers began to recognize the significance of values and their rankings:

What seems common to both Harris's confused notion of cultural contradictions and even the Rimrock study, in retrospect, is that both treated values like lists of inviolable constraints. In other words, if two values conflicted, say honesty and accomplishment, a quandary arose – how to understand why one value was respected while another was not. People understood, of course, that not all values received equal priority. Davidson (2004, 60) even refers to "value ranking," in the following:

> *"Now suppose that our judge owns the house coveted by B and C and that she has decided to sell it to one of them. We can imagine that there are three distinct steps in her reasoning, insofar as it involves the desires of B and C. First, she determines what she can of their preferences, their* **value rankings** [emphasis mine, DLE]*, perhaps on an interval scale. Second, she compares these preferences, her judgment or judgments being of the kind just mentioned."*

Conceptually at least values are ranked fairly easily, as can be seen in the following example. Assume that we are comparing the values of two cities, say Paris and Houston. Let us further assume that Parisians and Houstonians value "good food," however they define this locally. And let us suppose that both of them value being in good shape. Now, for the sake of discussion of this simplified value system, we propose the following rankings:

(1) Parisians: Good shape >> Good Food
(2) Houstonians: Good Food >> Good Shape

It seems fair to say that the different rankings of just these two values could produce different body shapes (add to that a finer analysis of what each group considers to be "good food" and the differences grow), in spite of the fact that it is true to say that the two cities have the same values. In this case it is not the values but their relative ranking that makes the difference. Thus it is essential not only to have some idea of what a group's values are, but – as the Rimrock study presciently observed – also the prioritization of the values (and the rankings themselves are also dynamic, changing according to situation, subgroup, and so on).

How do we come up with reasonable hypotheses of a people's values and their rankings? Questionnaires and interviews are not enough, though they can provide some useful data. We also need participant-observer records accompanying the former. We need to study a variety of texts, conversations, and interactions – how are values portrayed, described, lived out, discussed, reacted to. Actions and words often are in conflict. People imagine that their values are one thing but their actions show either different values or different rankings or finer nuancing.

Notice that the question of cultural relativity does arise in this context, but not in a naive way. Societies must have values and structure and these values and structures can differ in ranking, identity, complexity, number and so on. But there will always be some degree of overlap. We never reach what Davidson () referred to as incomensurable "conceptual schemes." This overlap between humans need not be ascribed to innate knowledge, but to external organizational pressures, as well as innate emotional structures, our physiology, etc.

Nevertheless, just as there are many aspects of theoretical linguistics which are vital still for understanding languages, especially of the Platonic formal variety (Katz (), Postal (), etc.) and Construction Grammars (Goldberg (); Croft ()), and Role and Reference Grammar (Van Valin and LaPolla ()), the problems with Kluckhohn's program do not eliminate any usefulness for the notion of values in understanding culture.

Let's consider again, the pioneering work of Milton Rokeach. Rokeach (1973, 5ff) defines the notions of value and value-system as follows:

> *"A value is an enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable to an opposite or converse mode of conduct or end-state of existence... 'A happy life is preferable to a sad life,' for example would fit this whereas 'A happy life is preferable to fried eggs,' would not." And also, "A value system is an enduring organization of beliefs concerning preferable modes of conduct or end-states of existence, along with a continuum of relative importance."*

Returning to the question of methodology, there is a minimum threshold of research to incorporate an understanding of values into a particular ethnography. There are several steps:

(1) Through observation of behavior (we must begin with what people actually do and what they avoid) identify potential etic values (how are resources (money, time, fuel, food, etc. used, how are activities and ends related, and so on).

(2) Identify professed values: what do people say that they value, in Rokeach's sense of values?

(3) Posit emic, tacit values using the standard distributionalist methodology of linguistics (Pike 1967, etc).

(4) Test emic values

(5) Propose potential value systems (how are values ranked relative to one another in systems such as food, religion, philosophy, relationships, employment, language, and so on? How do values shape or affect different roles of an individual in society?

(6) Test value systems: For example, how do values interlock and vary within and across systems such as food, government, religion, and so on? Are potentially useful predictions made? Do they hold up?

(7) Test value rankings

(8) Look for individual variation in value inventories, value-systems, and value rankings.

(9) Write up findings across value-systems.

Here the write-up would follow the basic principles of the definition of culture suggested earlier. Emic values become visible and differentiated from etic values when we ask questions such as "What values do native speakers pay attention to." "How are

different values distributed among the population?" "How do different etic values get grouped together by native speakers as the same values according to circumstances?"

Once we have undertaken such initial studies, we can attempt to craft an ethnographic description of the target culture. This will be a very similar effort to the description of a new language. Though each language or society may be relatively independent of other languages or societies, there may be causally significant contact affecting pairs of languages via contact between societies at a macro level or by individual bilinguals/biculturals. Both kinds of structures are relatively stable, outlasting the lives of the individual members of the society or the speakers of a language. For example, a language may have dialects distributed in space or distributed in terms of social levels, time, style, idiosyncracies (idiolect). There are subgroupings and interlocking groupings (where members belong simultaneously to different groups – yet share values and rankings to some extent), roughly identifiable along the lines of linguistic isoglosses. An isogloss is a geographic boundary marked by a particular linguistic feature, such as pronunciation of specific segments, a different word form (e.g. "gumband" which means "rubberband" in the Pittsburgh area and environs), or different constructions, e.g. the geographical distribution of "my cars needs wash*ed*" vs. "my car needs wash*ing*."

It is with the work of linguist Kenneth Pike (1967) that notions of culture begin to capture the dynamics and structure missing from other definitions, because Pike's research is informed by his research in language and linguistics. Using his understanding of language, Pike argued that a society is "... a structured group of individuals sharing in ... behavior [whatever social behavior one chooses to examine, DLE].

This notion of structure is further clarified by Pike (---) as a "grammar of society" and, in my terms, a "grammar of culture." In this sense, a culture is partially a C(ulture)-grammar. Like any grammar, a C-grammar can only be revealed and tested by a solid methodology and rigorous testing of hypotheses. A grammar is also understood as a link between a form instantiating it and meanings derived from the resultant form and its structure.

D'Andrade () correctly observes that earlier treatments of cultures as grammars were too simplistic to be of much use. But the claim I am making here is that culture is only partially constructed grammatically, or, alternatively, that a culture contains many grammars produced and interpreted by the culture's values. Whether the entire culture can be said to be a grammar is not the point of the discussion here. But that every member of a culture has a variety of ever-changing roles that are sanctioned by, produced by, valued by, and understood by the culture in question.

Society and culture are thus not (just) grammars – but they are connected and constructed in grammar-like ways and especially in their local contexts, groupings, and actions. A Bostonian investment banker and an Amazonian hunter find their place, or if preferred, "make their place," by occupying a series of grammatical nodes in society. These nodes are rarely invented. One cannot be a professional musician without an entire technology, social role, and payment structure produced by society over time. And the structures and roles and fillers of the socio-cultural grammatical system into which we are born emerge themselves from the ranked values and supporting beliefs of the culture. In this sense, if we take culture as beliefs, knowledge, and values and society as roles and structural relationships between them, with members of society as "slot-fillers," then we

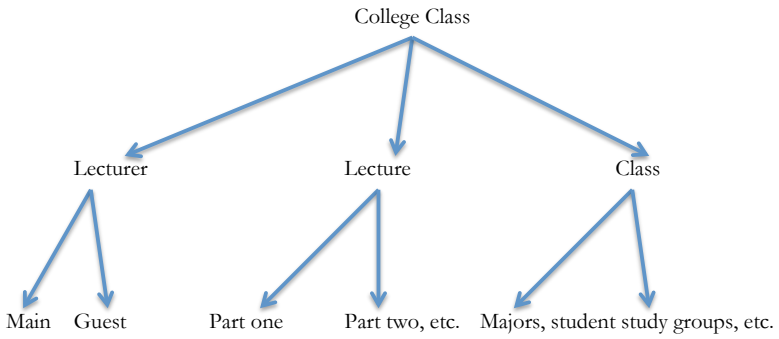
begin to develop an idea of culture as meaning projecting society as structure/grammar, from which individual "meaning" and purpose emerge in conjunction with the small vocabulary of individual psychologies.

How might this work out in practice? A C-grammar must begin with the individual. We can thus think of all the individuals of a society as "fillers" for C-grammar slots. In this regard, consider a classroom experience. First a grammar must have slots and fillers. The fillers are easy – these are the students and the professor. The slots are "speaker," "talk," and "hearers." The semantic roles of each of the slot:filler pairs are, "lecturer," "leacture," and "class," assembled in a simplified form like:

College Class

() Speaker:Lecturer + Talk:Lecture + Hearer:Class
() fillers: professional specialist, student, types of lecture.

This unit of a C-grammar is equivalent to a sentence, though it will have immediate constituents, as in:



There is a cultural structure, a college class, that has at least three components, a predicate (what is being done culturally, i.e. a lecture), an actor (the lecturer) and recipients of the lecture, the class. These are the immediate constituents of the cultural event. They are themselves broken down into constituents. So a lecture may be split between a guest speaker and the main lecturer or teacher, each contributing a portion. Or between the teacher and youtube or film, etc. The lecture will itself be organized into

different sections, in order to facilitate more effective communication. And the students will fall into subconstituents of the class, e.g. different study groups, different majors (when relevant to the composition of the class or targets of the lecture) and so on.

Taking Pike's analysis of society as a type of grammar seriously, a society will have a range of forms to express its values or meanings. We can analyze these forms as generated from a dynamic combinatorial grammar of roles, fillers, and slots, or we can take forms of the grammar to emerge from a more static inventory of cultural "constructions," along the lines of Construction Grammar in linguistic theory (see Croft (), Goldberg (), among others). The choice is not critical at this stage, though there could be significant empirical differences as the ideas are explored in future works.

Different constructions or grammatical outputs will be found in different societies based on different cultures. For example, a culture that values sports may have units called sports teams, with fillers that ultimately come down to individuals called athletes. There could be an entire constituent, e.g. the University of Michigan football team. Such a unit would be a C(ultural)-syntagmeme. This syntagmeme will be composed of smaller units or "immediate constituents" such as defensive team, offensive team, special teams, bench, coaching squad, etc.

A token of a C-tagmeme will be a group on the field at a particular time. This formal unit will have constituents and a meaning, namely, the function of the team on the field. Each member of the team will also have a meaning, i.e. his or her role on the team. According to Pike, society will be structured into many such teams with criss-crossing membership.

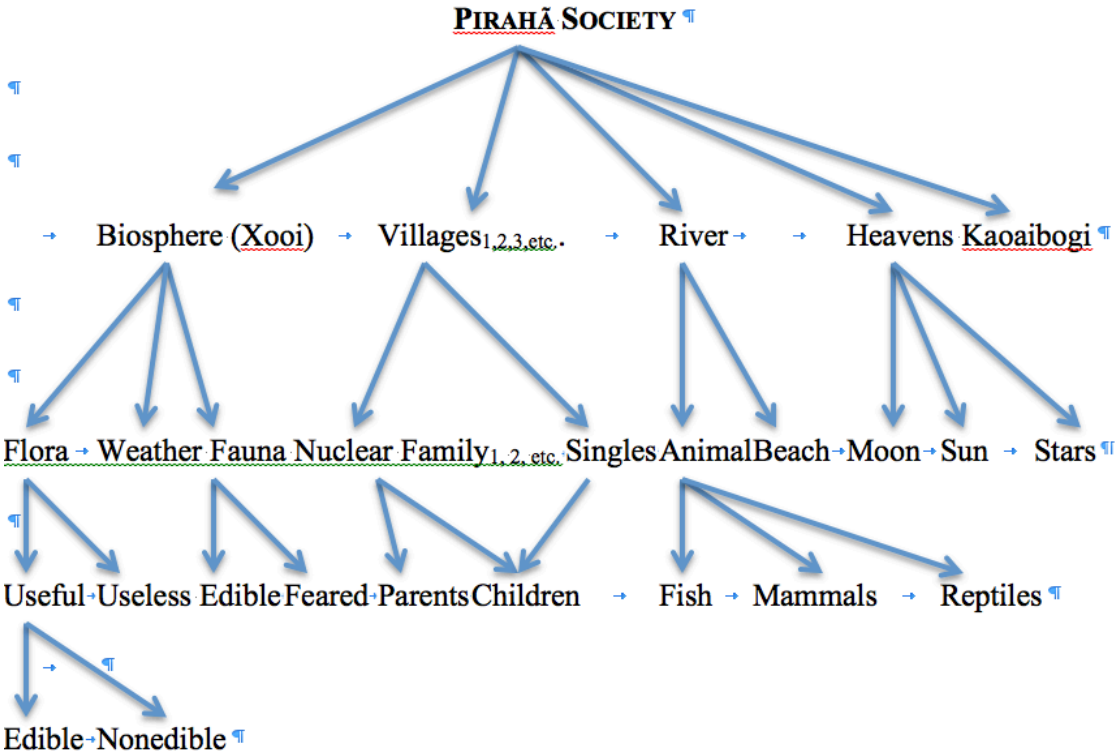
But what about simpler societies? In Pike's sense a society will be simpler if it manifests fewer C-syntagmemes. Consider, for example, an Amazonian society such as the Pirahãs. That society will be manifested by its individuals and "parsed" into its immediate constituents: village communities, families, men, children, adolescents, women, and so forth. Another group might instead be parsed into kinship groups, e.g. families, clans, lineages, and so on.

To act together we must in some way share an intention that our individual actions produce a result of the group. Voting is arguably such an action. Participating in a classroom lecture is another. These are all *predicates* in the grammar of culture in which each person occupies a role, alone or jointly, a lot in the C-sentence or C-discourse. For example, in diagram __ above, the lecturer is the C-subject. The students are the C-object. The lecture is the C-predicate. In the linguistic act of the lecture, the topic or theme is what is being taught. But in the social organization, the students are the object rather than the subject matter. We are describing their social roles in this moment in time to a particular teacher.

When participants are from different cultures, as in the earlier Medicine Lodge example, they may think that they understand their roles, the structure, and the meaning of the joint act they are engaging in. But they often do not realize that each participant possesses a separate cultural semantics for interpreting the activity they are engaged in. In my view of the entire situation, this is what happened: The Comanche interpreted the predicate of the Medicine Lodge event as immediately-in-effect conditionless promises, considering all actors as equal plenipotentiaries. The American negotiators saw themselves as subordinates to Congress, the Indians as a group that should accede to a greater authority and their joint act of treaty-signing as entering into a conditional, time-

delayed initial offer. They also saw the Indians as inferior beings whose opinions and understanding mattered less.

Pirahã society lacks sports teams, specialized professions, and so on. As an egalitarian, unspecialized (professionally), smaller society of intimates it will be parsed into fewer constituents. Still we can look into its constituents. Roughly (very much so), Pirahã can be described by the diagram below:



The chart of Pirahã society is not intended to be complete. But it does cover a lot of what is important and, in my understanding, the constituents of Pirahã society as perceived by the Pirahãs. Their society incorporates setting, humans, humanoid creatures (**kaoiaibogi**), different groupings of flora and fauna, nuclear families, etc. So the biosphere is the **Xooi**. This word means "the environment in which we live, move, and have our being." When one is going to the jungle one says "I am going to the **xooi**." When a parent wants a child to sit still in the canoe they will say "Move not into the **xooi**." When the Pirahãs talk about moving to another river or far downriver or upriver, or far to the interior, they describe all of these as "moving to a different **xooi**." The next immediate constituent of Pirahã society are its villages. Every village is known to all Pirahãs at all times, even though they can be more than 100 miles apart and even though their composition is constantly shifting. The river is the next immediate constituent of Pirahã society. Perhaps as much as 70% of the Pirahãs' diet comes from the river. River animals are crucially important to them in ways that jungle animals are not. But the river also organizes their village living, such that in the dry season they are on the beach and in the rainy season in the forest. However, at no time are they more than a hundred feet or so from the bank or edge of the river. In the river there are fish – of paramount importance to Pirahãs – and other animals, e.g. caymans, snakes, manatees, porpoises,

sting rays, and other creatures that they do not eat or at least very rarely eat. The fish will be divided into constituents corresponding to the Pirahãs's idea of species (as will other animals). The plants around them will be either useless to them (a few kinds of bushes, ferns, etc) or useful. Of the latter some will be edible, e.g. Brazil nuts and fruits, while others will not be, such as vine for baskets, bark for bowstrings, wood for bows, and so on. The nuclear family will be manifested by parents, children, and anyone else occupying the same hut, e.g. grandparents on occasion, spouses of children, and so on. This is rather fluid. Some single people in the village live alone. There are a few single parents. This diagram, then, is just a way of illustrating how the Pirahãs break down the important components responsible for their values and day-to-day life as a society.[11]

Cultural values, conventions, and so on will serve as the interpretative "linking rules" (see Van Valin and LaPolla () for a discussion of form:meaning linking rules in language).

Taking a field perspective of Piraha C-grammar, the structure of a particular society comprises a set of relationships in a network (White and Johansen 2006). Individuals belong to a network of criss-crossing hierarchies and relationships. Each individual thus is located by coordinates in simultaneous matrices
Pike (1967, p644) says that "As language utterances in sequence form a hierarchy of parts, whereas the language units as an abstract system constitute a network of intersecting hierarchies, so society likewise has the activities of its individuals sequentially but hierarchically structures while the relationships between those individuals themselves are integrated are integrated in a total network."

Also important to understanding culture and society is the linguistic notion of "complementary distribution." Individuals can have distinct identities or a single identity in multiple modes of manifestation (think Clark Kent vs. Superman). As Pike observed, not entirely tongue-in-cheek, in a strictly distributionalist view of the individual, Siamese twins represent a "unit-boundary problem." A culture is an amorphous mass in some ways. It is like an enormous discourse. It isn't likely possible for a single tree diagram to map it out in any useful way. On the other hand, its constituent components, like the sentences of a story, may be individually diagrammed in order to represent their major organizational units and principles. Thus the construction-based language of thought is also the language of language and the language of society – a mode of human organization. Still, it is worth considering more deeply the linguistic model of cultural analysis.

For example, consider an analysis of leadership in a given society. *Emic* leadership vs. *Etic* leadership – members of a society see a leader has having characteristics even when they do not and while ignoring other characteristics because of the "emic unit" of president, fireman, nurse, etc. Changing the *emics* of roles, e.g. nurse = male OR female results from changes in the nature and later the perception of the role.

In the study of a cultural grammar, we need to know how our theory should help us understand the constituents of a culture. One example might be the study of the leadership role of president. We discover, let us say, that a president signs documents,

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[11] One of the more interesting immediate constituents of Pirahã society are **kaoaibogi,** literally 'fast mouths,' which represent a largish group of human-like entities that the Pirahãs claim to interact with. At one time I confused these with the concept of "spirits" but they are in fact seen as living creatures of a different order than animals or humans. (See Everett (2008) for details.)

makes speeches, talks to people, and gives orders. But so does just about every modern professional. So these are etic activities initially in our analysis. Yet if we watch many different individuals engage in etically similar (or even identical) activities, the question we need to answer is "what meaning underlies the actions that distinguish the role in question," e.g. the US Presidency from other roles. Some questions that we might ask as we try to understand the insider, emic perspective are: When does the president do these things? What does the president sign? What are the contexts and contents of the president's speeches? Who are the addressees of the president's letters and speeches? What social authority underlies the president's activities? Etc.

The president signs laws passed by Congress. The president speaks on matters of local, state, federal, and global significance. His or her words influence others because of the office they hold. The president addresses – qua president – individuals, groups, and organizations. Holders of other roles have no societal sanction to do as the president does and the meanings of their actions, even when similar, are different. OK, so far, but how does a specific role and set of behaviors arise in the ranked-value, grammatical? To see this, let's consider a harder problem.

This problem was suggested to me by Eugenie Stapert in her ongoing research. How do members of a speech community distinguish a native speaker from a non-native speaker? Though there is no single sufficient condition, categories that could distinguish etic and emic perspectives could include the following: discourse and use of gestures; constructions and lexemes; conversation turn-taking conventions; semantic fields; prosodic and gestural guides to the pragmatic organization of speech; body orientation; pronunciation; use of jargon and slang; clothes; etc. Etically a speaker may manifest these features. But emically one only counts as a native speaker if one manifests these features in *meaningful* ways – using the appropriate etics in native contexts with native intentions.

The definition of culture offered earlier should help us understand the multitude of manifestations of communities living culturally: patterns of behavior, social roles, institutions, tools, museums, etc. It follows from my definition, "culture-with-a-small-c" underlies "Culture-with-a-capital-C." An example that stands out in this regard is my favorite museum, the majestic Rijksmuseum in Amsterdam, the Netherlands.

The Rijksmuseum was founded in 1800 in the capital of the Netherlands, the Hague. Eight years later it was moved to Holland's most beautiful and important city, Amsterdam. The state museum, like many others around the world, was founded to reflect the values (shown in particular histories illustrated, artists selected, accomplishments highlighted, and so on) and the wealth (another value) of the nation.

Cultural values ooze from its walls. Each of the one million objects owned by the museum reflects a choice motivated by a value of some subgroup of Dutch culture. And of that million, each of the 8000 or so objects actually selected for display, owes its place in the public space of the Rijksmuseum to a choice that at least in some cases reflects the value perceived by the selection subgroup as reflecting the values of the entire community of the Netherlands.[12]

The art library in the Rijksmuseum, the display of the country's naval history, the Rembrandts, etc. – all of these selections help create Culture-with-a-capital-C, (or what some might refer to as Kultur). The expression of the values of a people. The literature that becomes popular likewise. And music, etc.

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[12] Numbers are from Wikipedia.

But in examining the components of culture or Culture, we must not forget that culture's "bits" can be shared across a diversity of networks. The American rock 'n' roll or rap played on a Chinese radio station may reflect a cultural network of teens around the world rather than merely a component of American culture. In fact I remember hearing teens on the BBC years ago express the sentiment that they feel closer to people who like the music they like than they do to people who live in the same country, share a religion, or speak the same language.

If we examine art within the Rijksmuseum we see further examples of the enveloping cultural network. The most famous work of art in the Rijksmuseum is Rembrandt van Rijn's imposing painting "The Night Watch" (or more accurately, "The Company of Captain Frans Banning Cocq and Lieutenant Willem van Ruytenburch Preparing to March Out"). This painting dates to the Golden Age of the Netherlands, and was completed in 1642. The painting is – like so many others – embued with symbolism relevant to its home community's values, knowledge, and roles. In the painting we see values of Dutch culture of that time, in the very idea of a "watch" (vigilance against invasion and crime); the ideas of virtue and noblesse oblige of the wealthy; and the larger need for vigilance in all areas of one's life, the circumspection of the "good Christian."

Rembrandt's work was hailed in his lifetime, but his reputation also declined precipitously in his lifetime. The rise in popularity of painters such as Anthony van Dyck, whose work contrasted so strongly in color and light with Rembrandt's (much brighter, much more upbeat than Rembrandt's) adversely affected the reception of Rembrandt's work as the newer work reflected changing values and standards of beauty. Since Rembrandt's death, of course he has been recognized as one of, if not the, greatest of all Dutch masters. And yet those who attend to the connection between culture and dark matter realize that change in any artist's reception or a painter's reputation reflects the shifting values of those who behold the art rather than from the art alone. In fact, the reader or looker or hearer's culture is the most significant factor in success of the artist (or inventor, or CEO, etc). The artist who can best read or predict those values and their shifting rankings among their audience – and adapt to them – will enjoy the lion's share of success.

Our perceptions and the full range of our thinking is shaped significantly by our cultural network. This observation leads me to my first criticism of the research program of artificial intelligence – in any of its variants, from GOFAI (Good Old Fashioned Artificial Intelligence) to current programs. So long as we refer to AI as *Artificial* Intelligence, I agree that it is an interesting and extremely important research program. Unfortunately, many of its proponents want to drop this qualifier prematurely. Computers do not form values by interacting with the world and other individuals. Until they do – and at a high level of detail – they do not and cannot think like humans. To better understand this point, I wonder to reconsider and early famous attempt to make the case that computers can think.

In particular, I here want to review the work of Simon, Bradshaw, and Zytkow (1987). Following on Simon's (– – –) long-term research program on understanding and modeling human problem-solving, the authors discuss the automatization of (at least parts of) the process of scientific discovery. They make three fundamental assumptions at the outset. These assumptions are worth considering in some detail because they illustrate the contrast between the non-cultural reasoning of the artificial intelligence community my

thesis that intelligent agents are cultural agents. To my way of thinking, comparing artificial intelligence to natural intelligence is conceptually similar to comparing the flight of a Boeing 747 with the flight of a bumblebee. There will of course be general physical principles of flight that will apply to both. Yet there is no interesting sense in which the Boeing 747 teaches us how the bumblebee flies qua bumblebee or how its flight "feels" nor how its flight is shaped by those it is flying with.

Simon and his co-authors list three principal assumptions that guide their investigation:

First, *"... the human brain is an information-processing system whose memories hold interrelated symbol structures and whose sensory and motor connections receive encoded symbol structures from the outside via sensory organs and send encoded symbols to motor organs."*

Second, *"The brain solves problems by creating a symbolic representation of the problem (called the problem space [all emphases in these quotes are in the original, DLE]) that is capable of expressing initial, intermediate, and final problem solutions as well as the whole range of concepts employed in the solution process..."*

Third, *"The search for a problem solution is not carried on by random trial and error but is selective. It is guided in the direction of a goal situation (or symbolic expressions describing a goal) by rules of thumb called heuristics."*

What these authors are trying to understand, of course, is the *dark matter* underlying scientific discovery. Describing the process does not imply that there is either a normative theory of scientific discovery for humans, nor that the heuristics of scientific discovery can be transformed into algorithms.

This work was important and Simon's own pioneering understanding of human problem-solving won him the Nobel Prize in Economics in 1978. Nevertheless, the points above are problematic. For example, one serious question is raised by what the authors intend by the phrase "problem-solving," and the relevance of their focus of scientific discovery to human cognition more generally. Not much in fact. Yet this is what they are interested in of course so it hardly counts against their account. At the same time, the unlikelihood that their solutions will "scale up" to human reasoning render them too specialized for any general account of human psychology. The examples they select, for example, are tailored to solutions via symbolic processes. They nowhere address the wider range of problems human must solve, including some of the most important ones of life, such as "How should I live," "Who should I marry," "What should I believe," "How can I learn to square dance," "Who should I vote for," and so on. These deeper problems involve physiology, culture, emotions, and a myriad of other non-symbolic aspects of human cognition. To be sure, many of these other problems have large informational-symbolic components, but what makes them hard and vital are precisely their non-informational components. And there are larger problems, even as the discovery procedures are cultural reflections.

Before closing this chapter, there are a couple of issues that need to be examined to further clarify the concept of culture being developed. Again, the claim is not that dark matter is culture but that culturing produces dark matter which includes "idioculture" as one of its components, i.e. the cultural knowledge possessed uniquely by a given individual, just as a "language" is found only in individual idiolects.

The first matter we need to understand as part of the culture are tools. How are we to characterize tools, things that are used to aid individual cultural members in different tasks? Tools are dripping with dark matter and culture. I conceive of them as *congealed culture*. Examples include shovels, paintings, hats, pens, plates, food, etc. And as Everett (2012) argues, language and its components are among the list of tools produced by a culture. Culture itself is a tool.

The tool-like nature of language can be seen in its texts. Texts (discourses, stories, etc) are used to exhort, to explain, to describe, and so on, and each text is embedded in a context of dark matter. Texts, including books are of course unlike physical tools in the sense that as linguistic devices they could in principle have told us something about the dark matter from which they partially emerge, though generally very little is conveyed. And the reason for that is clear. We talk about what we assume our interlocutor does not know. And dark matter, which we do not always even know that we know, is simply overlooked or presupposed.

Language as a tool is also seen in the *forms* of texts. Consider in this regard once again the list of so-called contradictory principles that Harris provided above with regard to the Hindu principle "avoid fecal matter."

"A spot must be found not too far from the house.
The spot must provide protection against being seen.
It must offer an opportunity to see any one approaching.
It should be near a source of water for washing.
It should be upwind of unpleasant odors.
It must not be in a field with growing crops."

The first line uses the indefinite article 'a.' In the second line the definite article 'the' is used. From that point onward, 'spot' is pronominalized as 'it.' This is because of English conventions for topic-tracking (Givon ()) through a discourse. The indefinite article indicates that the noun it modifies is new information. The definite that it is shared information. The pronoun that it is topical. As the single word is referenced and re-referenced throughout the discourse its changing role and relationship to shared knowledge is marked with specific grammatical devices. This is shared but unspoken, and largely ineffable knowledge to the nonspecialist.

How does the understanding of culture promoted here compare to the wider understanding of culture in a society as a whole? It is common, for example, to hear about "American culture," "Western values," or even "Pan-human values" and so forth. According to the theory of dark matter and culture developed above these are perfectly sensible ideas, so long as we interpret them to mean "overlapping values, rankings, roles, and knowledge," rather than a complete homogeneity of (any notion of) culture throughout a given population. From laws to pronunciation, from architecture to music, to sexual positions and body shape, the action of individual humans as members of communities ("likers of Beethoven," "eaters of haggis," and on and on) in conjunction with an individual's apperceptions and episodic memory – all are the products of overlapping dark matters.

A similar question arises as to whether it makes sense to speak of "national values" and, if so, how these might arise. Again, such values are values shared by a significant number of members of a nation, due to similar experiences. For example, people of my generation had three television stations to choose from. There were few if

any fast-food chains. The food available in supermarkets across the USA was fairly constant. Thus a person growing up in Indiana would have very similar experiences with cultural products as a person growing up in Southern California. This has changed dramatically over the last fifty years, but still there are a number of things shared in common – uploading videos to youtube, reading news on the web, smart phones, using apps, and so on. Such experiences trigger the formation of similar dark matters across large numbers of individuals. Even at the level of an entire country, continent, or the world of television viewers, internet access, and so on.

Just so values can produce in an individual or in a community a sense of *mission* – e.g. the Boers, the Zionists, the American frontiersmen and settles in *Manifest Destiny*. The Third Reich.

This sense of mission and purpose is what many businesses are after today as the use of the term culture has been adopted by companies as "what they are all about." Businesses (e.g. http://www.dtnmgt.com/our-culture-) commonly dedicate webpages, documents, lectures, meetings, and so on to establishing a sense of culture (which is often little more than an unranked set of values and occasionally goals (as though these were separate from values), with no discussion of knowledge or roles). Though these business-co-opted ideas of culture differ significantly from some academic understandings, they are nevertheless not terribly wide of the mark, even if they represented an unarticulated subset of the idea of culture that I am urging here.

When we look at individual businesses, the ethnography of commerce more generally, the anthropology of money, or any other area of business from a cultural perspective, there are various possible approaches, from diachronic to synchronic, from symbols to actions, to patterns, practices, and so on. But the fundamental question in the study of business from my perspective is just the same as the fundamental cultural question for any domain – what are the emic units, the etics units, and process of emicization?

While people can be expected to share values regardless of where they are found, this should not be overstated. It is of course true that as biological entities, we paint our lives from a palette of overlapping "colors" (e.g. the similarity of the problems we face or our biological resources). Yet if I am correct, our differences are far more profound than our similarities. The dark matter that includes the ineffable, the unspoken, the not often spoken, and the hard to say is a product of a specific place, time, individual psychology, apperceptions, memory and culture. In this sense, my theory agrees with Edward T. Hall's "silent language." As he put it so perspicaciously: "*What is most difficult to accept is the fact that our own cultural patterns are literally unique, and therefore they are not universal* [emphasis Hall's, DLE]."

Although there are most certainly general principles of human behavior and the formation of dark matter, the combinations of individual apperceptions with exposure to mere subsets of larger value, knowledge, and role networks means that no two people will be exactly alike in any way.

Other examples of dark matter are useful and easy to find. So consider the important things we rarely say. How do you stop at an intersection? How do you aspirate a consonant? Why do we recreate the spatial configuration of events by their position relative to the anterior portion of our bodies rather than global directions such as North and South? When I went to the Amazon to begin field research, I wanted to work on texts

that would simultaneously teach me about the Pirahãs' language and culture. I did not realize at the time that there is in fact no other kind of text. Still some aspects of culture were obvious to me so I began with arrow-making. It turns out that this is knowledge all male Pirahãs share; knowledge they rarely if ever talk about; but knowledge they obviously can talk about. In fact, the first text I ever collected (see below) was on arrow-making. As my years among them went by, I became fascinated by this topic-knowledge transmission without language.

There are better examples of knowledge that is unspoken, though. Nonhuman animals present superior examples in some ways. These animals have beliefs, desires, and emotions, learn complicated behaviors and ways of interacting with the world. Yet they lack language altogether and so, by definition, cannot talk about their knowledge. All nonhuman animal knowledge is therefore tacit. Most people wave their hands at these fascinating phenomena sweeping them all under the label of "instincts" rather than knowledge.

My dog, like other dogs, humans, and other animals goes through an attachment period, is driven by emotions, learns tricks, learns to obey a range of commands, comes to sense ownership/relationship/belonging to certain items in its environment, and so on. My 140-pound Fila Brasileiro, for example, barks when even slight changes are added to the environment – a stack of books in a strange place, cushions from the sofa piled for cleaning, a new car in the driveway, and so on. While my dog cannot "tell" me about this in English, through her barking and body posture she communicates relatively well, though many of her actual feelings no doubt remain ineffable.

Humans learn things too that are ineffable. We have non-informative labels for many of these things, though. So much as we label some animal knowledge as "insinct," we often refer to ineffability of human abilities as "talent." For example, there are creative writing courses at many universities. But no one can teach you to write *quality* lyrics, novels, creative non-fiction, music, visual art, and so on. You can improve through instruction. Someone might be able to teach you how to write in a style *like* Tom Wolfe or to compose *like* Bach, but you cannot be taught how to write *as well as* Wolfe, compose *as well as* Bach, paint *as well as* Van Gogh, etc.

There are several reasons for the ineffability of talent. First, talent is to some degree a social ascription. When we say that "She has got *it*" that *it* is a social appeal in a limited temporal context, along the lines of the formation of a band in the Springsteen quote at the beginning of this book. Second, talent sits and the confusing interface of knowledge-that and knowledge-how. Third, talent is not a cause but an *effect*. Writing a novel is an illocutionary act, but producing a novel that is considered brilliant requires a perlocutionary effect. The same goes for dancing well. Or any other ability. The society must sanction them and agree that you are good at them.

Another form of ineffable tacit knowledge is how we gesture to accompany spoken speech. We can describe (see chapter --- for an in-depth discussion) gesture scientifically and study them. We can distinguish etic from emic gestures in particular cultures. But speakers themselves cannot tell us why they make certain gestures, when they make them relative to the speech stream, why some are used repeatedly throughout a story or conversation while others may emerge only once, etc.

Exposure to overt knowledge in other contexts related to tacit knowledge in our more familiar contexts becomes enormously informative if we can relate the two (which

is non-trivial). For example, I really only began to understand my native English when I first studied Spanish in sixth grade. When any person begins to probe for alternatives to their customary behavior, the diffuse light of their intellectual torch shines back on what they left behind, however momentarily – their path as they walked just before "here" and farther before the "there" ahead. Just as *hablar* taught me that 'to speak' is a verb, so *tortilla* helped me to understand the function of 'bread.' In the many years I lived among peoples of the Brazilian Amazon, especially among the Pirahãs, I saw the norms I had left behind in ever-brightening bas-relief. As my relationships changed to include a wife who loves animals, animals entered my beliefs, desires, values, and thoughts in the heretofore unexperienced role of friends and companions. This intrusion of animals has illuminated my relationships and thinking about humans. With each person I learn to like, love, or dislike, I learn more about those who already populate my past and present.

The desire to understand the various levels of human knowledge, from the explicit to the deeply-embedded muscle memory of our flesh, is hardly new with me. This is *the problem* of human existences. One can talk about this knowledge as a psychologist, as a psychiatrist, as a philosopher or a jurist, an anthropologist or a linguist, a minister, an imam, a chef, or a novelist. The crucial step is to recognize one's vantage point, to the degree that this is possible in a rain forest carpeted with trees that block out one's narrow horizons, or on a busy street valleyed between skyscrapers, or an open field from which no other reference point is available for miles.

On the other hand, we each begin from the same vantage point – our self. But what is this self I look out from upon the foreground and background of my visual field? How does this self come to be? In a delicious irony, determining the nature of our self-centered vantage point can answer the most profound questions of the "other," as the other can answer the most profound questions about me. Anthropology begins simultaneously with me and them.

The knowledge that makes us who we are is part body and part culture-mind, where "mind" is a way of talking about neurological development and "culture" is way of talking about the societal contribution to that neuromental development – procedures our brains go to first out of habit, in turn determined to large extent by the society in which the brain is found. For each member of a society, there will be a group with which he or she identified. In fact there will be several – some overlapping, some without any point of connection other than the societal member in question. Each human is a social nexus.

There is a Brazilian expression, *Se der bolo eu tiro meu corpo fora!* 'If it gives cake I take my body out!' I love this because literally interpreted it means nothing in English. The first time I heard it, it was completely opaque to me. The meaning derives from the perceived complexity of cake-baking, especially among those whose literacy skills make it difficult to follow recipes closely, rendering the final product lottery-like. But even for those who can follow recipes easily, a cake is a very complex item. The same flour that makes chapatis and gravy can make German chocolate cake. This humans-as-cakes metaphor, or humans-as-any-complex-mix concept, seems more useful to me than the "man in a can" view of the nativists. Sure, parts of us are innate. But the real action is in the variation of combinations and connections formed by our movements through the social world that make us each unique in nontrivial ways. This mixing, though, cannot be seen directly. The invisible matter of our brains is crucial in the composition of our selves and natures.

Human psychology and human culture construct one another, as Sapir argued more than eighty years ago (see especially the edited volume of Sapir (1993)). On the other hand, the work here differs significantly from Sapir's in that it addresses not only the biological and cognitive "platforms" (see Everett 2012) upon which language, culture, and interactions are built, but also the ways in which our selves and the very construct of human nature emerge from this interaction over the generations.

That is one view of culture and its symbiosis with dark matter. From here, I want to explore the ontogeny of culture and dark matter. How does the child make the change from part-alien to insider?