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Communicating Culture: An Evolutionary Explanation

Hacia una nueva conceptualización evolutiva de la comunicación «cultural»

ABSTRACT
Whether gathering around bonfires, watching TV, or sitting in front of computer screens, the pressures of Darwinian natural selection have forced individuals into tight patterns of interdependency, welded together by communication links. Can the information-sharing behavior of our species ever be brought into broader perspective and eventually foster greater harmony for all humankind? The authors argue that the answer to this question is «yes». Culture provides the necessary space for social negotiation and change. Advanced communication ability is the means by which this necessary cultural work is perpetually accomplished. A non-deterministic understanding of culture must be acknowledged from the outset. Cultural life differs greatly from biological conditions. Even under repressive conditions, culture is not determined the same way viral infections ravage biological bodies or computers. Technological advances in communication do not simply reinforce and intensify top-down, dominant cultural messages as theories of imperialism, memetic transmission, or social contagion contend. The pace of cultural development over the past 10,000 years has been particularly fast compared to any other time since hominids split from our common ancestor with chimpanzees millions of years ago. Our species' unique skill as communicators in the dynamic technological and cultural environment of today offers real hope for retrieving the primordial affinities that unite us all.

RESUMEN
Ya sea reunidos alrededor de una fogata, viendo TV o sentados frente a la pantalla del computador, las presiones de la selección natural darwiniana han forzado a los individuos a ceñirse a cerrados patrones de interdependencia, los que a su vez han sido estructurados mediante lazos comunicacionales. ¿Puede ser analizado este hábito de compartir información de nuestra especie desde una perspectiva más amplia y, eventualmente, fomentar una mayor armonía para toda la Humanidad? Los autores sostienen que la respuesta a esta pregunta es afirmativa. La cultura proporciona el espacio necesario para la negociación y el cambio social, y la habilidad de comunicación avanzada es el medio por el cual este trabajo cultural necesario se logra perpetuamente. Una comprensión no-determinista de la cultura debe ser reconocida desde el principio. La vida cultural difiere mucho de las condiciones biológicas; incluso bajo circunstancias represivas, la cultura no evoluciona de la misma manera que las infecciones virales devastan los cuerpos biológicos o los ordenadores. Así los avances tecnológicos en la comunicación simplemente no refuerzan e intensifican verticalmente los mensajes culturales dominantes, como sostienen las teorías del imperialismo, la transmisión memética, o el contagio social. La marcha del desarrollo cultural, durante los pasados 10.000 años, ha sido particularmente rápida, comparada con cualquier otro lapso desde que los homínidos se separaron de nuestro común ancestro con los chimpancés, hace millones de años. La habilidad única de nuestra especie como comunicadora, en el dinámico entorno tecnológico y cultural actual, es una esperanza real para recuperar las afinidades primordiales que nos unen como seres humanos.

KEYWORDS / PALABRAS CLAVE
Evolution, evolutionary communication, culture, meme, cultural transmission, cultural development.
Evolución, comunicación evolutiva, cultura, transmisión cultural, desarrollo cultural.

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1. Communicating culture: an evolutionary explanation

«You're the leader of a primitive village. If you want to survive in a hostile world, you must evolve! In «The Adventures of Darwin» you will drive the evolution of your village from a small group of simple primates to a powerful, intelligent colony of humans. Lead your tribe on adventures, teach them to hunt, teach them to build, and teach them the simple power of language...». The Sony PlayStation video game, «The Adventures of Darwin», encourages gamers, many of whom are in their early formative years, to see the world through evolutionary eyes[1]. In a simple but cogent way, the game highlights the important link between emerging forms of ancient social organization and the empowering force of human communication. Over the millennia our ancestors acquired an unequaled ability to share information, form and maintain social relationships, innovate, and develop advanced civilizations and cultures because we became the most skilled communicators on Earth.

Driven by the relentless pressure of natural and sexual selection, the emerging modes of human communication steered human evolution in productive directions and accelerated the speed with which social and cultural change occurs. Communication complexity evolved with social complexity. Two factors motivated the synergy: 1) communication ability makes high level social interaction possible, and 2) effective social interaction greatly increases an organism's prospects for survival. The defining characteristics of modern civilization developed because of evolutionary advantages brought about by language and other forms of advanced communication marks «perhaps the only clear distinction between people and other species» (Wade, 2006).

It wasn't always so. A fortuitous progression of biological mutations and behavioral changes eventually endowed humans with the capacity to express themselves in sophisticated ways and coordinate their efforts to survive. This development helped change the status our species from that of scavenger and the prey of larger and faster beasts to innovator and successful predator. Beneficial variations developed to further advantage and continue to do so. Every major stage in the development of human communication represents a vital evolutionary transition (Maynard Smith & Szathmáry, 1995).

2. Within, without

Whether gathering around bonfires, watching TV, or sitting in front of computer screens, selection pressures and the biological requirements of reproduction forced individuals into tight patterns of interdependency welded by communication links. Can such time-tested and productive loyalties ever be brought into broader perspective and eventually overcome in order to bring about greater harmony for all humankind?

Genes replicate. People imitate. Genes don't think about what they're doing. People presumably do. Nature and culture do not make up separate spheres of life; culture stems from nature. But processes of biological and cultural change differ in fundamental and important ways. That's where the hope resides.

Biological replication is comparatively direct. Among sexual species, genetic information passes from parent to offspring as sequences of DNA and transmission takes place only once—at the moment of conception. Once the seed is planted, nature does the rest of the work. Success of the organism depends largely on the physical tolerance and nurturing qualities of the parents, especially females, and sheer good luck. In this sense, biological inheritance is passive. Cultural transmission, on the other hand, occurs when information that exists outside biological organisms passes from one generation to the next through social communication. The process is far less straightforward than genetic replication. While biological mutations are random and selected post hoc, cultural choices are motivated from the beginning.

Culture is hard won. It resists change, especially for the short term, but is not set in stone. To the contrary, «culture provides the necessary space for negotiation and change. Advanced social communication ability is the means by which this work is accomplished». Some ideas perform evolutionary functions more effectively than others. Ultimately those ideas will be selected. Directed cultural evolution –or cultural development– operates with the power of conscious reflection and reason.

Our biological selves are not determined by genes and our cultural selves are not dictated by tradition. They travel an uncharted course together adapting to environments that are also changing in a never ending process of biocultural feedback (Johanson & Edgar, 2006). As Geertz (1973: 48) described it, «Between the cultural pattern, the body, and the brain, a positive feedback system was created in which each shaped progress of the other»).

Genes make up stretches of DNA that contain instructions for making protein molecules[2]. They function like a recipe for biological growth and

behavior. The ingredients and cooking process, however, are set by the environment (Richerson & Boyd, 2006: 9). Gene-culture interaction may even help explain one of the great mysteries of human behavior—how the psychological dispositions of individuals and the internal cultural patterns of groups shape consciousness and prompt people to act in specific ways[3]. Human behavior appears to shift over time from that which is learned by observation to something that is programmed and stored in the brain by genetic assimilation learning (Pinker & Bloom, 1990). Those behaviors that afford a fitness advantage will be repeated and selected. The resulting genetic structure then reflects the inculcated behavior and helps direct its future deployment.

As Steven Pinker, a key proponent of this idea, points out, «genes can't pull the levers of our behavior directly. But they affect the wiring and workings of the brain, and the brain is the seat of our drives, temperaments, and patterns of thought» (Pinker, 2009: 26). Because a person has an inherited genetic tendency for obesity, for example, doesn't mean the individual will become obese. The environment also contributes to the way behavior unfolds, but in Pinker's words, «the environment is not a stamping machine that pounds us into shape, but a cafeteria of options which our genes and our histories incline us to choose» (Pinker, 2009: 29).

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3. Memes

More than thirty years ago, Richard Dawkins put forward the idea that organic life's basic unit explains evolution's long term outcomes: «They are in you and in me; they created us, body and mind, and their preservation is the ultimate rationale for our existence. They have come a long way, those replicators. Now they go by the name of genes, and we are their survival machines» (Dawkins, 1989: 20).

The title of his book, «The Selfish Gene», reveals Dawkins' argument. Rather than looking at human evolution from the point of view of the individual organisms or particular groups that have survived, we should think of evolution from the perspective of the genes that have been passed on from generation to generation over the millennia. Of course biological inheritance and genes alone don't explain the totality of human evolution. Wrestling with this very issue in the same volume, Dawkins briefly introduced the meme as a way to conceptualize, if not fully explain, the presence, proliferation, and appeal of certain cultural themes and traits. The question is profound. Why do some cultural ideas inspire enduring widespread acceptance and utility? Drawing illustrative parallels between genetic replication and cultural transmission, Dawkins (1989: 192) speculated on how cultural ideas might establish and maintain their influence: «Just as genes propagate themselves in the gene pool by leaping from body to body via sperms or eggs, so memes propagate themselves in the meme pool by leaping from brain to brain via a process which, in the broad sense, can be called imitation».

Since the publication Dawkins' groundbreaking work, the meme has found a place in scientific reasoning and the English language. The Oxford English dictionary defines a meme as «an element of culture that may be considered to be passed on by non-genetic means, especially imitation». Some social scientists talk about memes when describing the rapid circulation of cultural phenomena. The meme has seeped into contemporary popular culture. The meme is a succinct, catchy, and sensible descriptor of a huge and unwieldy idea.

Its attractiveness, however, can mislead. Dawkins (2006a: 191) himself does not claim that memes resemble genes precisely or that any theory of memes adequately explains how cultural transmission takes place. Genetic replication is not the same as social imitation. «I am not saying that memes necessarily are close analogues of genes, Dawkins explains, only that

the more like genes they are, the better will meme theory work». He proposed the concept of the meme as a way to describe a reproductive agent capable of spreading ideas and producing cultural patterns. More than thirty years after introducing the concept, Dawkins (2006b) again made it clear that he «never wanted to push [memes] as a theory of human culture, [but] almost as an anti-gene point– to make the point that Darwinism requires accurate replicators with phenotypic power, but they don't necessarily have to be genes».

4. Memes, Viruses

Despite Dawkins' warnings, the meme has become a meme itself –an idea that has caught on. But if memes exist, how do they travel, enter individual minds, and affect consciousness? The American philosopher Daniel Dennett argues that the passing of cultural ideas from one person to another corresponds to the way multicellular organisms first came into being (Dennett, 1995). Although scientists have yet to explain with certainty how multicellular organisms appeared on Earth, the best guess is that various parasites invaded and inhabited the original unicellular organisms as they reproduced asexually in the primeval soup. This merging of unicellular organisms gave rise to biological symbiosis and engendered the first signs of multicellular life. Dennett suggests the same kind of evolutionary template structures the way memes invade and accumulate in human minds. A process of assimilation enables the transfer of cultural elements from one person to another leading to creation of widespread cultural themes and social norms. The meme, in Dennett's memorable phrase, is a «data structure with attitude» (Dennett, 2009).

The British psychologist Susan Blackmore defines the very existence of modern cultures as «the legacy of thousands of years of memetic evolution» (Blackmore, 1999: 182). Memes «are instructions for carrying out behavior, stored in brains», she argues, much the same as «genes are instructions for making proteins, stored in the cells of the body» (Blackmore, 1999: 17). Blackmore focuses her writing largely on the causal mechanism of memetic transmission proposed by Dawkins – social imitation. From her perspective, learning how to copy each other's actions gave early humans superior ways to think and set the stage for cultural transmission and development. The imitator-sender encodes a message; the receiver-imitator decodes one. Ideas underlie actions, so memetic imitation has content, not just form. The meme performs simultaneously as a set of instructions for cultural transmission and as a unit of shared cultural meaning – complementary roles that actualize when individuals communicate with each other.

> Any idea of cultural transmission as a virus, therefore, should be put to rest. The magic of social contagion resides not in a virus, a meme, or a network. All forms of cultural transmission have one thing in common: it is communication activity operating under selection pressure. Contagion has a selective goal on the part of all its participants, whether they realize it or not. Communication gave rise to the first common gene pools and cultural tribes.

Social imitation constructs, empowers, and enables the spread of memes from person to person. But memetic cultural reproduction involves more than the social transference of information. The most scientifically dubious and controversial claim about memes is that they have the potential to take on lives of their own. Those ideas that resonate throughout social systems turn into free –floating cultural elements– memes. Therefore the meme must be understood as a bifurcated socio- cultural phenomenon that can only be described adequately with a compound definition: «memes are cultural ideas that inhabit the minds of individual human beings who pass the ideas along to others but they also function independently from their human hosts». From the songs you can't stop singing in your head to fantasies dreamt up about heaven and hell, the impact and staying power of particular cultural elements attest to the psychological and social influence of the meme.

Selection principles underlie memetic transmission. The best human imitators of ideas survive while others die away (natural selection). Imitation

ability, or more broadly communication skill, becomes a key criterion for choosing mates (sexual selection). Some memes survive at the expense of other memes (memetic selection). The rough similarity between genetic and cultural replication demonstrates the potency of memes. If biological evolution can be understood by examining DNA that has passed through time, then cultural priorities should be revealed by studying the discursive and pragmatic themes of social life that survive. From this perspective, memes function as commanding motivators of cultural transmission. They could rightly be called «selfish memes» (Distin, 2005).

Culture is an extremely nebulous concept. Memes –the constituent elements of culture– must be similarly confounding. No one has ever seen a meme. That fact alone, though, shouldn't surprise or discourage. No one had seen a gene either until DNA was discovered in the middle of last century. But the abstract concept of the gene had been anticipated more than a hundred years earlier in studies of pea plants conducted by the Augustinian monk Gregor Mendel in the former Austrian Empire. Mendel believed some systemic principle of biological particularity underlies the inheritance of plants and probably animals too. Genes later became identified as that agent and genetics developed as the system that governs the inheritance of biological organisms. Scientists have isolated the physical phenotypic patterns of genetic transmission and the mechanism that creates those patterns –stretches of DNA.

So far we don't have the same kinds of insights or achievements when trying to explain how and why some cultural traits develop and endure while others do not. The most we can say is that successful memes serve as analogues to successful genes so long as we think of the outcome of culture transmission macroscopically – widely-accepted values and practices that broadly differentiate one social group from another. But memes signify broadly. A meme can refer to a tiny bit of material culture – a regional sauce used for cooking, for example– or it can represent the least material dimension of culture– the idea of God. Memes reside in everything that surrounds and prompts us to think and act in certain ways. The idea of a vegetable is a meme, for instance, and so is vegetarianism. An aluminum can is a meme, and so is recycling. A linen blouse is a meme, and so is fashion. Some of the ideas in our worlds and in our heads (sauces, gods, vegetables, vegetarianism, cans, recycling, blouses, and fashion, for example) get copied with such frequency they come into high relief and persist over time.

Like genes that require a secure home from which to operate –the double helix configuration of DNA nested within a biological carrier– memes need help too. They require vehicles to carry them around and help spread their influence. The notion of a carrier that houses and mobilizes memes, however, may not adequately represent the functional complexity and capability demanded of the host. Cultural transmission requires continuous exchanges between the articulating agent and its cultural milieu, so the terms carrier, vehicle, or medium seem too limiting for the job. «Interactor» expresses the idea better (Hull, 1988; Aunger, 2002). A meme must not only reside somewhere and move about but also interact advantageously in cultural contexts that are loaded up with other memes competing for attention. The most common and useful interactors are people. People acquire, embody, transport, communicate, and give credibility to the cultural materials and ideas they host.

Every cultural artifact and belief –from simple items like eating utensils, bookmarks, shoes, and shopping carts to the most imposing cathedrals, temples, mosques, and gods they claim to represent– embody and transmit multiple memes. For example, an eating utensil references kinds of food, family life, and ways of eating among other meanings. Schools, religious organizations, political systems, civic groups, media institutions, and all other social institutions harbor, endorse, and disseminate a variety of abstract memes. Cultural meanings inhabit even more metaphysical realms – gender roles, dietary restrictions, funeral rituals, folkloric traditions, academic theories, «ad infinitum».

5. The wide scope of memetic transmission

Just as genes function in gene pools, where individual genes become viable and influential because of their association with other genes, memes act in concert too. Dawkins refers to these mutually-reinforcing cultural associations as a memeplex (Dawkins, 2006a: 196-200). For example, the automobile belongs to a memeplex that contains many diverse memes having to do with general concepts of machinery, transportation, freedom, responsibility, style, licensing, and regulation as well as specific brands, logos, advertising campaigns, and so on. Today's automobile descends from invention of the wheel, discovery of the axle, fusion of the drive train with the combustion engine, industrialization of the assembly line, refining of petroleum to produce gasoline, and other phenomena. Another familiar and useful example is the telephone. We recognize the

telephone as personal communications technology. But the telephone was designed originally as an aid for the hearing impaired and later became a surveillance and information tool used during wartime. Each cultural moment remains in the modern telephone today. It continues to serve as a hearing aid, an essential piece of military equipment, and an information-sharing, consumer-driven communications medium facilitated by fiber optics, satellite technology, and the worldwide telecommunications industry. Distilled remnants of foregoing types like those present in the automobile and telephone persist in the biological world too. That fact helped Darwin figure out crucial aspects of common descent with modification. Darwin's law of reversion describes how the «long lost character» of previous generations appears in the offspring of animals many generations down the line (Darwin, 1859/1979: 201).

Cultural artifacts and ideas never succeed solely on the basis of their functional qualities. They project powerful symbolic meanings that accompany and often exceed the significance of whatever practical purposes they serve. Every artifact and idea is nested within a cluster of potential meanings that radiate omni-directionally through social interaction. The complex ecology of a meme can be hegemonic and limiting at the same time. Personal freedom, for example, inheres as a muscular cultural value in automobiles and telephones but stringent restrictions on the use of cars and phones have also evolved as part of their memeplexes.

Despite appearances to the contrary, neither genes nor memes takes initiative or has intentions. Nonetheless, in line with selection principles, they evolve in ways that are advantageous to themselves or they wouldn't exist. Like the healthy diversity that arises within and among biological organisms and communities, some memes become particularly good survivors in the presence of other members of the memeplex, especially when complicated or controversial belief systems are involved. A successful gene pool resides in human hosts and perpetuates itself by means of sexual reproduction. A viable memeplex functions as a matrix of ideas, customs, and traits that inhabits human and nonhuman hosts and transmits influence from generation to generation through human communication. Like biological organisms, the fittest memes –those that attract the most positive attention and maintain their popularity– survive to affect subsequent generations.

How memes and memeplexes spread their influence has often been compared to the way an invasive virus can ruin a body or machine. From this point of view, memes infect our lives. They are contagious. Parasitic. Memes steal into our worlds and control how we live. There is no escape. In «The Meme Machine», Susan Blackmore (1999) argues that the cognitive algorithms of memes render cultural freedom illusory. Consciousness doesn't exist apart from the tyranny of memes because a totalizing homology develops between the agents of memetic reproduction and the human mind. We become the memes that surround us. Humans have no independent mind to protect us from «alien and dangerous memes» (Dennett, 2006: 342-352).

Is this true? Are we such passive casualties of culture? Dominant cultural traditions and practices frame and guide our thinking, often subconsciously, and not always to our benefit. They socialize us to accept basic cultural assumptions and to conform to behaviors and rituals without questioning their history or whose interests they represent. Winners and losers emerge. No doubt, memes can cause real harm to individuals and societies. But it is not a cultural virus that causes the damage. The meme-as-virus metaphor fails to explain how cultural transmission takes place and what the true consequences are. Viruses only bring misery. Cultural life, even under repressive conditions, is not determined the same way viral infections ravage biological bodies or computers.

6. The global reach of cultural transmission

Comparing cultural transmission to the spread of a virus recalls standard theories of cultural and media imperialism. The regrettable story is well-known. For centuries, colonizing nations violently imposed their will on the less developed parts of the world, especially Africa, Asia, and the Americas, and later ransacked the colonies for economic and geopolitical gain. Indigenous cultures were plundered. Even decades after most colonial nations won independence, the former colonizers continued to wield economic, political, and cultural influence over their subjects and still do. The whirl of globalization assures that cultural influence continues to spread from the former imperial nations –England, France, Spain, Portugal, Holland, Russia, and Japan especially– but also now from the United States, of course. The new colonial outposts are empires of the mind. Multinational corporations like McDonalds, Disney, Microsoft, Coca-Cola, and Nike work over-time to exploit global markets. The pattern of influence is vertical. Global media and information and communications technology perform as interlocking

instruments of contemporary cultural oppression.

Theories of cultural and media imperialism coincide with another hypothesis born of early twentieth century social science –media effects or direct effects. Media effects theory postulates that mass media overwhelm mass audiences in widespread processes of mass communication. Like accounts of cultural imperialism which drew heavily from Marxism and mass society theory, the relationship between senders and receivers of messages is considered to be exploitative and one-directional. A powerful stimulus elicits the desired response. Structure conquers agency. Mass media and the culture industries corrupt culture, pollute consciousness, manipulate behavior, and undermine the human potential.

This way of thinking has its roots in humanistic philosophy and liberal politics and deserves to be respected. Theories of cultural imperialism and media effects were advanced to critically reveal how the cultural media of the nineteenth century were influencing society. Blaming the media never goes out of style and the argument, simple as it is, will forever bear an element of truth. But the media landscape has changed so much in recent years that arguments based on last century's realities no longer advance the critical debate productively. The sheer amount of information circulating the globe and the explosion of cultural resources and communications technologies available to people almost everywhere have radically changed the nature of cultural experience.

The passive audience for media, if it ever really existed, disappeared long ago. More accurate depictions are the engaged audience, participant, cultural user, or even more accurately, the cultural programmer (Lull, 2007). The greatly expanded symbolic features of modern culture give individuals much more control over their life than before. Any idea that individuals or groups become hopelessly victimized by their cultural experiences and relationships grossly distorts what's happening.

The idea of the meme as a virus and the old fashioned theories of imperialism and direct effects only connote the negative consequences of cultural transmission[4]. This is incomplete, misleading, and even dishonest. Charles Darwin had thoughts about the spread of ideas too, but he focused on the positive and organic nature of the process. In «The Descent of Man», for instance, he wrote of how members of various cultural groups could eventually overcome their differences and begin to «look at [members of other groups] as our fellow creatures» (Darwin, 1871/1981: 127). Communicative interaction would make this possible: «As soon as [concern for the welfare of others] is honored and practiced by some men, it spreads through instruction and example to the young, and eventually becomes incorporated into public opinion» (Darwin, 1871/1981: 127).

> Biological evolution has created an unfathomable array of life forms since the Earth was formed more than six billion years ago. In but a tiny fraction of that time cultural development has ushered in modern science, technology, democracy, civil institutions, even little pills that prevent pregnancy and prolong sexual performance. Nature is pure information; it provides us with endless resources. Culture is applied knowledge; it alters what nature gives us. The trajectories of natural history reveal a crucial distinction. Evolution is about variation in nature; development is about innovation in culture.

Spreading information and opinion throughout a society or culture by means of «instruction and example» where it becomes «incorporated into public opinion» resembles the social imitation principle of memetic transmission proposed by Dawkins. It also fits with a more recent research trend—the science of social contagion or network science (Christakis & Fowler, 2009). This approach builds on the personal influence model of mid-nineteenth century American social psychology. Opinion leaders influence the voting and consumer behavior of others through a two-step or multi-step flow of information and opinion

that goes from experts to followers on topics ranging from beauty tips to political candidates.

The premise is evolutionarily sound: all of humanity is interconnected and our actions invariably affect the actions of others. The explanation of how those actions actually play out, however, is weak: good ideas, bad ideas, moods, and behaviors travel like viruses from person to person, sometimes indirectly, by an unspecified mechanism of influence. The individuals who make up a social network come to share emotional states like happiness, physical traits like being overweight, or personal habits like smoking. Person A might influence Person B directly so that both individuals come to share a trait. But Person A could also influence Person C, who is connected directly to Person B even if Person B is not affected and Persons A and C never meet. The network thus has some kind of mysterious power of its own. People in social networks apparently converge in a way that exceeds the power of any solitary individual to affect another directly. So what's at work here? A virus? A meme? The network?

Alternative explanations of social contagion may be more satisfying than speculative network theory. We gravitate toward people who are already like us. Peer pressure affects our decision making more than the arrival of an unfamiliar idea. Established personal preferences and habits override encroachments from the outside. Interpersonal power differences based on family position, social class, and professional hierarchy often render lifestyle decisions involuntary. And of course information and communications technology interfere with any direct network effect in daily life.

Any idea of cultural transmission as a virus, therefore, should be put to rest. The magic of social contagion resides not in a virus, a meme, or a network. All forms of cultural transmission have one thing in common: it is communication activity operating under selection pressure. Contagion has a selective goal on the part of all its participants, whether they realize it or not. Communication gave rise to the first common gene pools and cultural tribes. Our habits inside these pools and tribes emanate from and reinforce survival strategies. To be out of step with our social groups limits our viability as we see every day in our personal and professional lives.

Today, with the ability to communicate at great distance literally at our fingertips –the keypads of our mobile phones and keyboards of our computers– the drive to connect with others has intensified proportionately. Traditional boundaries of intimacy have fallen by the wayside. Texting, sexting, sending photos, posting the most person details of one's life, and tweeting about every mundane moment are desperate pleas for social acceptance with clear evolutionary motives—survival and reproduction.

7. Nature, culture, and communication

Darwin recognized the role of communication in this kind of cultural development when he compared how information flows in different societies. The language of Darwin's day may offend, but the point remains correct: «In semi-civilized countries, with little free communication, the spreading of knowledge will be a slow process» (Darwin, 1859/1979: 97). Now, more than 150 years after Darwin published «The Origin of Species», the United Nations Development Programme uses different phrasing to advocate the same idea. Expanded communications and exposure to a broad range of cultural resources –especially novel ideas arriving from afar– are fundamental to social progress, particularly for developing countries (UNDP 2004).

Any idea that humans haven't evolved much biologically since our ancestors left Africa 50,000-60,000 years ago simply isn't true. The pace of evolution over the past 10,000 years has been particularly fast compared to any other time since hominids split from our common ancestor with chimpanzees millions of years ago (Harpending, 2009). Still, biological evolution remains relatively slow, conservative, and undirected. It has no goals or interest in human welfare (Wade. 2006: 34). The twin motors of biological evolution –natural and sexual selection– respond gradually to random mutations and hang on to solutions that create stability and security.

By contrast, cultural development is fast, innovative, and purposeful. Like a dragster that blazes from 0 to 100 miles per hour, culture can heat up quickly. Biological evolution has created an unfathomable array of life forms since the Earth was formed more than six billion years ago. In but a tiny fraction of that time cultural development has ushered in modern science, technology, democracy, civil institutions, even little pills that prevent pregnancy and prolong sexual performance. Nature is pure information; it provides us with endless resources. Culture is applied knowledge; it alters what nature gives us. The trajectories of natural history reveal a crucial distinction. Evolution is about variation in nature; development is about innovation in culture.

Notas

[1] Electronic Arts' Spore might help popularize evolutionary thinking among young video game players too.

[2] Genes don't do this alone. Ribonucleic acid (RNA) molecules also influence the complex process of protein production.
[3] Richerson and Boyd. The helpful term «internal cultural patterns» is from Thomas Sowell, «Race and Culture» (New York: Basic Books, 1994)
[4] The exception to this criticism of meme theory is Richard Dawkins, the originator of the concept. Dawkins' initial and subsequent discussions of memes do not appear to be politically motivated.

References

AUNGER, R. (2002). *The Electric Meme.* New York: Free Press.
BLACKMORE, S. (1999). *The Meme Machine*. Oxford: Oxford University Press.
CHRISTAKIS, N. & FOWLER, J. (2009). *Connected*. New York: Little Brown and Company.
DARWIN, C. (1859/1979). *The Origin of Species.* New York: Random House.
DARWIN, C. (1871/1981). *The Descent of Man*. Princeton: Princeton University Press.
DAWKINS, R. (1989). *The Selfish Gene*. Oxford: Oxford University.
DAWKINS, R. (2006a). *The God Delusion*. New York: Houghton Mifflin.
DAWKINS, R. (2006b). *Afterword*. Presented to London School of Economics and Political Science. March 16.
DENNETT, D. (1995). *Darwin's Dangerous Idea. Evolution and the Meaning of Life.* New York: Simon & Schuster.
DENNETT, D. (2006). *Breaking the Spell*. New York: Penguin.
DENNETT, D. (2009). *Darwin and the Evolution of «Why». Address Given to Darwin Anniversary Festival.* Cambridge, UK. July 8.
DISTIN, K. (2005). *The Selfish Meme*. Cambridge, UK: Cambridge University Press.
GEERTZ, C. (1973). *The Interpretation of Cultures.* New York: Basic Books.
HARPENDING, H. (2009). *The 10,000 Year Explosion*. New York: Basic Books.
HULL, D.L. (1988). *Science as a Process*. Chicago: University of Chicago Press.
JOHANSON, D. & EDGAR, B. (2006). *From Lucy to Language*. New York: Simon and Schuster.
LULL, J. (2007). *Culture-on-Demand.* Oxford, UK: Blackwell.
MAYNARD SMITH, J. & SZATHMÁRY, E. (1995). *The Major Transitions in Evolution.* Oxford: W.H. Freeman/Spektrum.
PINKER, S. & BLOOM, P. (1990). Natural Language and Natural Selection. B*ehavioral and Brain Science*, *13*; 707-784.
Pinker, S. (2009). My Genome, my Self. *The New York Times Magazine*, January 11; 26-30.
RICHERSON, P.J. & BOYD, R. (2005). *Not by Genes Alone*. Chicago: Chicago University Press.
UNITED NATIONS DEVELOPMENT PROGRAMME (2004). *Human Development Report: Cultural.*
LIBERTY IN TODAY'S DIVERSE WORLD. New York: Oxford University Press.
WADE, N. (2006). *Before the Dawn.* New York: Penguin.