

# Embodiment and Cultural Differences



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Edited by

Bianca Maria Pirani  
and Thomas Spence Smith

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## PREFACE

ELKHONON GOLDBERG

How do fundamentally similarly designed human bodies interact with vastly disparate cultural, political, and economic contexts? This is the subject of this fascinating volume edited by two distinguished social scientists, Bianca Maria Pirani and Thomas Spence Smith. The book itself is multicultural, its contributors representing a true cross section of countries, personal backgrounds, and points of view. It takes us on a journey through the plight of a female journalist in a newsroom in India; the spiritual tribulations of born-again Christians in the United States; elusive, gut-feeling-driven skills of recruitment consulting in Finland; the suffering and painful adaptation of local tribes in conflict-ridden north-eastern Uganda; the effects of New Year's Eve violence in Cologne and the refugee influx on the collective European mindset; the diversity and synergies of urban communal life in Portugal; the introduction of basketball by the colonial American government in the Philippines and its cultural impact; the many ways of enhancing mobility in able and disabled bodies in society; and the cultural ambivalence toward mixed-race children in Japan. If this compendium is not truly cross-cultural, then what is?

This dazzling display of human stories, covering the full gamut from the benign to the horrific, aims to capture the richness of human experience. The biology of the human body is not explicitly emphasized in the book but its presence is implicitly felt throughout. Two themes are implicit in the narrative: the tension between the relative invariance of the human body and the bewildering diversity of the human condition and human culture, and the amazing capacity of the human body for adaptation. This purpose is accomplished by the book's authors brilliantly, and the book's editors should be complimented for the interesting and balanced selection of chapter topics. The scholarship that comes through in every chapter is solid and rigorous, and the narrative is vivid and dynamic. The scope of the book and its resonance with the central themes of our time are remarkable. These themes include the tension, fears, and ambivalence gripping much of Europe in the face of the spate of terrorist attacks and a

refugee influx unprecedented in modern times; gender inequality and the increasingly universal movement to challenge and overcome it in the developing countries; the changing nature of the workplace in the post-industrial world; violence and chaos in failing societies; tensions between ethnic globalization and parochialism; challenges of urban life; religion in the modern society; the multifaceted legacy of colonialism; and casting aside the limitations of a physical body in the age of high tech.

Not being a social scientist myself (I am a clinical neuropsychologist and cognitive neuroscientist), I found the approach, the clarity of writing, and the breadth of the book exceptionally appealing. I am confident that other educated outsiders to social sciences will share my enthusiasm. At the same time, the serious and analytic tone of the essays should be attractive to the social scientists and students of social sciences. It is a vibrating, pulsating book aptly capturing the challenges, anxieties, and hopes of human beings at the intersection of biology and culture in the modern world.

The issues touched upon in the volume invite a dialog and an interaction between social sciences and cognitive neuroscience. What is the nature of the interaction between external circumstances imposed by the society at large, which are often not under the individual's control, and the decision-making processes leading to personal choices, which to varying degrees are? How does an individual make choices in an inherently ambiguous and fluid environment that is society, and how does one act on these choices? These are the central issues of our times, and addressing them requires an interdisciplinary approach

Cognitive science, neuropsychology, and neuroscience are only now beginning to tackle these central questions. Much of this research focuses on the brain's prefrontal cortex and related structures, and new paradigms are being developed. Classic neuropsychology and cognitive science have focused on veridical cognition directed at solving problems characterized by intrinsic true-false metric, but decision making driven by personal choices is very different.

We are only now beginning to understand the cognitive processes and brain mechanisms responsible for what I call "agent-centered decision making,"— decision making based on personal preferences and priorities. We are finding interesting and potentially consequential individual and group differences, and we are discovering how different neural structures contribute to these processes. But all the current studies have been conducted in relatively homogeneous Western or Westernized cultural environments of the advanced countries of North America, Western Europe, and the Orient; and this leaves out much of the world. The



challenge ahead of us is to understand the intersection between individual agent-centered decision making and the variegated host cultures that shape it. Cross-cultural cognitive psychology has a long and productive history. By contrast, cross-cultural cognitive neuroscience and cognitive neuropsychology are in their infancy. The overwhelming majority of neuroimaging studies designed to understand the mechanisms of decision making, as well as the clinical neuropsychological studies, have been conducted in the developed countries characterized by relatively homogeneous cultural environments. It is a leap of faith to assume that individual decision making is the same across vastly different cultural environments and contexts, but we make this leap of faith anyway, fallacious as it may be. The odds are that cultural differences in the cognitive attributes—such as the degree of conformism, traditionalism vs innovation, degree of risk aversion vs risk-taking, and others—will be embodied in subtle, or perhaps even not so subtle, differences in the neural architectures underlying individual agent-centered decision making.

Agent-centered decision making is very different in societies where individual rights are respected and protected as compared to those where the specter of arbitrarily inflicted punishment looms over an individual, and this also may be reflected in the differences in the underlying neural machineries. Individual decision making is also very different in stagnant, dogmatic societies as opposed to dynamic and fluid environments, and it is almost certainly affected by the degree of overall literacy and by the nature of dominant beliefs in the host society. Do these and perhaps numerous other differences in the cultural context in which an individual finds herself or himself through an accident of birth shape the neural machinery of personal decision making; and if they do, then how? We have no empirically grounded answers to these questions because of the cultural homogeneity of the environments in which cognitive neuroscience research is typically being conducted. To put it plainly, cognitive neuroscience research is dominated by cultural chauvinism, instead of cultural diversity, which is long overdue.

The immediate question that triggered my interest in “cross-cultural neuroscience” is this: To what extent is brain maturation preordained and invariant across cultures and environments, and to what extent is it shaped by the latter at least to a degree (and to what degree)? I talk about this in my books *The Executive Brain* (2001) and *The New Executive Brain* (2009) in reference to the frontal pathway myelination, which, according to North American studies, is not complete until the age of 35 or even later. But since the frontal lobes are in charge of the highest-order decision making, planning, foresight, impulse control, working memory, and other

cognitive and meta-cognitive functions, this would mean that much of human history was shaped by immature brains, since the kings and emperors of antiquity, middle ages, and even more recent times were often teenagers or in their early twenties—Pharaoh Ramses II, King David, Alexander of Macedon, Louis XIV of France, Peter the Great of Russia, etc. Or is it per chance the case that in environments where people assume “adult” roles and are called upon to make “adult” decisions at an earlier chronological age, the brain matures along different time trajectories?

In my books I write that the only way to ascertain this is by conducting neuroimaging studies in members of drastically different cultures. The basic idea is simple: to compare frontal myelination rates in the matched groups of Western and indigenous children/adolescents/young adults, using diffusion tensor imaging (DTI), white matter magnetic resonance (MRI) volumetry, or similar methods. Any differences that may arise will then have to be explained—in itself a challenge since the potential contributing factors are many: cultural, nutritional, viral exposure, etc. But given the increasing homogenization of the planet, such indigenous cultures are rapidly disappearing; they can only be found in the Amazon, Papua New Guinea and perhaps in a few other locations; thus such studies would be logistically very challenging and one may have to settle for a less ambitious research program.

While the question about the maturation of the frontal lobes is of great relevance to neuroscience, cognitive psychology, education, neurology of development and aging, it also opens the door for a much broader inquiry. A broad, systematic approach to “cross-cultural neuroscience” would entail a comprehensive and well-thought-through set of structural (DTI, morphometry), resting (default networks, seeds) and activation (mapping various cognitive domains) MRI studies, as well as studies using other neuroimaging methods in conjunction with thoughtfully designed cognitive paradigms. The implications of such a systematic approach may be profound on many levels—both fundamental and applied—and potentially full of surprises, possibly even upending some of our basic assumptions about the factors shaping brain development, brain aging, and brain function. The approach will be highly innovative. There has been some discussion in the scientific literature about cultural factors in functional brain organization but nothing systematic or programmatic so far.

Corporeal embodiment is a product of complex interaction between biology and culture but the human brain is part of our corporeal embodiment; and of all the organs in the living human body, it interacts with culture most closely. The question of how cultural diversity translates

into the diversity of neural processes is of paramount importance, and ripe with philosophical, scientific, and practical implications. It is the natural next step in the explorations of the embodiment and cultural differences. It is time to inaugurate “cross-cultural neuroscience” as a broad coherent discipline, and I embrace the opportunity to introduce the concept whose time has come in the foreword to this fascinating book. A comprehensive program in cross-cultural neuroscience will be a complex enterprise requiring ingenuity, dedication, collaboration among several disciplines, and substantial support. The effort will have to be both interdisciplinary and international. Launching such a program will be a daunting and challenging initiative but also an exciting and pioneering one. It will be profound in its scientific and societal implications, and a major step toward humanity understanding itself. So here’s to neural embodiment and cultural diversity!

**Elkhonon Goldberg**  
**New York, April 2016**

## FOREWORD

ROBERTO CIPRIANI

When we speak of *embodiment* we refer, essentially, to *impersonation*, that is, the transfer of something originating from without, into and through a person. Since people consist primarily of their bodies, it is therefore the physique of the individual that becomes the receptacle of the many input she or she receives, including influxes affecting and practically remodelling the subject's soma, to the point of connoting it indelibly. This is true of the transmission of values, behavior patterns, lifestyles and language, prevalent attitudes, reactive capacities as well as constructive and coercive functions.

In all of this there is, naturally, the context as a whole which exerts pressures and constraints, often turning space into an independent variable, as Nithila Kanagabasi demonstrates when discussing the workplace within the field of communications. Religion too plays quite a considerable role, as Anirudda Das, James Duncan Iuveniuk and Eduard O. Lauman point out when analysing the socio-religious situation produced by Born Again phenomenology. The recruitment of candidates for a job also gives rise to evaluative schemata and subsequent decision-making mechanisms that revolve around the fulcrum of the body, as suggested by Taina Kinnunen and Jaana Parviainen. And finally, the first part of the volume concludes with Hazama Itsuhiro's chapter, which examines the case of Ugandan community resistance against the damage caused to bodies by violence.

The book teems with ideas of considerable sociological and psychological-social interest as well as implications of a bio-medical nature, many of which are unknown to most. This emerges when discussing aging and attempting to define the ideal body, when addressing issues regarding physical disease and analysing the clash-encounter-exchange between the sexes. In sporting circles too (the example chosen by Craig Cook beginning with basketball) certain characteristics can cause a discipline to grow too rapidly and out of all proportion. The contribution made by the community is no stranger to this process, as emphasized by Mônica Mesquita, Filipa Ramalhete, Ana Paula Caetano and Karen François, who, by no chance are all women and engaged in research into

the invisible communities residing in the vaster urban areas of Lisbon, the main aim of is to examine educational processes of an emancipatory type, the socio-political role of the *bairro*- where people seek to solve the water-shortage problem and the professions are seen as social commitment - all in a strongly participatory and politically active key. Rachael Burke's contribution reiterates the importance of the educational perspective, especially during the early years, with particular reference to the ethnic-mingling experience. Last, but by no means least, Liz Depoy and Stephen Gilson deal with the *focus* or *fil rouge* of the entire volume which is inequality, viewed not only as far as gender is concerned but in all its multifarious manifestations. Most of the future of humanity is plotted during early childhood, as Jean Piaget stated repeatedly. This is why kindergartens, primary schools and the initial phases of the educational process are fundamental to the more or less positive aspects of relatedness between different kinds of embodiments: they are an extraordinary laboratory where it is possible to discover how the Incarnation/inclusion mechanisms of guiding values function. This way it is also possible, for example, to understand the distinction Pierre Bourdieu makes (1984: *Distinction: A Social Critique of the Judgement of Taste*, Routledge and Kegan Paul, London) between the body as a symbolic indicator of inequalities and of hierarchies of power. This is but one of the many implications alluded to in the complex set of solicitations found in the pages that follow.

**Roberto Cipriani**  
(*Roma Tre University*)



## INTRODUCTION

BIANCA MARIA PIRANI  
AND THOMAS SPENCE SMITH

Regardless of current theories, all higher or lower brain functioning is based and rests on automatic or semi-automatic base-level processes: the sublime is founded on the concrete and the complex on the elementary, without any solution of continuity. What then is *embodiment* in light of the new consideration of the body as a fundamental element of consciousness and memory? It can be defined as the *equilibrium limit* between the memory of time already passed and the dynamic *where* of unexpected happenings. The body's ecology is fulfilled in the environment within this variable limit. Each *embodiment* operation is, in fact, an experimental *setting* that consists of the *unrepeatable executive instants* through which, like a musical score, the body synchronizes human consciousness with the context of action. We are consciousness and memory in every moment of our existence. Only a renewed attention to this dynamic pair will contribute to inventing a new civil culture based on body rhythmicity, time, and seasons. Within this pair—variable in world history—each different body exercises the extraordinary complex of movements available in *time* before doing so in space. A profusion of scientific evidence now confirms that the regular practice of physical activity brings unquestionable benefits for the health of people of all ages and affects their psychological and physical well-being. The mediating mechanisms influencing body-sense through time are, however, poorly understood. The present study concerns these mechanisms and how movement can have an impact on this body-sense. In this scenario, our aim is to confirm whether people who use exercise as a “common rhythm”, i.e. on a regular basis, experience body-sense more accurately than people whose daily rhythms are limited to their essential daily needs. This idea is supported by a comprehensive sociological theory that strives to understand the meaning of human actions in which individuals are involved. Notably, the phenomenological assumption defended by Merleau-Ponty (1994) that those actions are embodied (through sensation and perception), and in

which movement becomes the central category of the bodily system. Additionally, the conceptualization about the body is upheld by health and sports science theories and corroborated by empirical evidence that shows how people's habits and daily rhythms have an effect on their individual experience and awareness of their bodies.

The most valuable resource human beings possess is time. Only those who invest in time can aspire to accumulate real and resounding wealth in any sphere, including financial. It would be advantageous to acquire this conviction. Time alone allows us to acquire knowledge—through study, experience, and mistakes—allowing us to make quantum leaps in any field. From a biological point of view, women start with an advantage: in the past, the males went hunting while the females had to look after children and be vigilant in order to understand in advance if those approaching the cave were dangerous or not. Only the precise exercise of attention allows time to be used creatively. Einstein said, “There are two ways to live your life. One is as though nothing is a miracle. The other is as though everything is a miracle.”

Einstein belonged to the second category, and for all his life, he invested in the *time factor*: a great lesson for becoming *intelligent adults* and thus escaping the condemnation of not growing up. Or worse, of not becoming adults. A threat looms over us, especially in Italy—as an Italian legal expert, Gustavo Zagrebelski, recalled.<sup>1</sup> According to Zagrebelski, there are three human ages: youth, adulthood, and old age. This has now been reduced to two as adulthood doesn't seem important anymore, especially to the economy, for which there are only two categories of consumers: young people and the elderly. The youth market has been artificially lengthened by flattery, peddling products to eternal Peter Pans, who, at any moment, find themselves old, without going through a conscious maturity. The book is not about age but individuals, and also the “generation” as the unit of measure of the age of the company. And here another reduction is in progress, in the name of survival of the living generation. We are in a situation of dynamism without dynamics because mobilization does not lead to anything more than the preservation of the status quo. In moral terms, it is the sympathy of all living and non-living, living towards the compromise. Living as if we were immortal, we modify life itself and its course's meaning and profile; and we transform, for the first time in human history, the existence curve—as it has always been called – into a long straight line that we have never had to climb, and which suddenly collapses when the deception of eternity—fictitious

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<sup>1</sup> Gustavo Zagrebelski, *Senza adulti* (Without Adults), Milan, Einaudi, 2016.



youth—collapses. A world without adults and without age operates on the belief that it is able to provide resources in an unlimited and immediate way, which the Earth is not able to offer for much longer.

These are troubled times, saturated with fear and tension in social, political, and media spheres. The *flow of time* is weakened: the passage of phases and their elapsing; the end of a season and its mutation to the start of the next, with different colors, tones, and modes, typical of each era. We live in a paradoxical universe without adults where small heroes are damned to stay alive and find, at a deeper level, anything that resembles hope. All that we have created to dominate life entitles us to demand immortality—medicine, of course, genetics, and biology, with their progress for mankind but also the social and cultural *make-up* at the service of fashion, treatments, lifestyles, with the promise of cheating reality, disguising aesthetics. There is a clear oddity: we are told that youth lasts a long time, eternal, actually, when we are consumers while we discover that it lasts less than one's actual age, and shrinks, when we are producers. Thus, we live our lives as the experience of a phase that is deceptively fixed forever.

Zagrebel'ski takes this alarm to the extreme. He cites the example of Easter Island, which had thousands of inhabitants at the beginning of the eighteenth century but was reduced to 111 workers a century later thanks to the deforestation that led to a decrease in the number of birds that could be hunted, wood for fishing canoes, and embankments of vegetable gardens. The voracity of the living generation had literally eaten the land for future generations. Only the gigantic stone heads remained: naked stones, totems of a power that self-destructs.

This “parable” is a severe warning for our global culture. The mobility of populations from one continent to another *seems an emergency* caused by ongoing wars and the intolerable poverty of some areas of the world but *it is not*. It will not stop in two or three years, as many hope. It is rather a movement of entire populations that will last half a century, at least, and will inevitably produce a gradual but unavoidable mixed race. We are facing the *unknown*. Here, Zagrebel'ski can only put forward the most daring, and by now essential, theme: that of the rights of future generations. We are clearly dealing with the simply human; rather, we should say pre-human because they relate to Earth's future inhabitants; prefiguration of pre-civil and pre-political rights. The *right to exist* is paramount, even before the right of the living. Zagrebel'ski affirms that our only salvation is the ethical category of duty without a corresponding legal right—duty alone, which is the exact opposite of the actual escape into the

illusion of infinite life, always equal to itself, as is propagandized and propagated by multimedia culture.

We ordinarily think of embodiment as enclosure in a biological or physical system yet when we view this concept sociologically, it reflects a decidedly cultural influence. The body, in Western thought, is a corporeal system that ends at the epidermis, so focusing on the body, by implication, means focusing on the individual person. Yet, as we now know, after decades of research in social neurosciences (Cacioppo, Berentson, Adolphs et al. eds., 2002; Cacioppo, Visser, and Pickett 2006) and of studies of the innate mechanisms at work in attachment behavior (Smith and Stevens 1996; Smith and Franks, eds. 1999), the basic “unit of analysis” for understanding social life is not the individual person but small systems of interaction, beginning with the dyad of a mother and her newborn infant. Infant-caregiver attachment, considered a system of interaction, forms an inborn paradigm for subsequent relationships; one that generalizes, lock step with cognitive and emotional development, to include other persons who are linked to the growing child, first in the family and thereafter in close-knit personal networks and face-to-face groups. Understanding these systems of interaction involves grasping the ways that innate physiological forces significantly shape all social interaction (Smith 1992, 1997; Smith and Stevens 1996, 1997, 1998, 1999).

How, therefore, can we reconcile cultural notions of embodiment with these innate neurosociological foundations of interaction (Smith and Franks 1999)? The answer lies partly in recognizing how “differences” play a part in social interaction and the integration of social systems. “Difference” begins, of course, with differentiation—the separation of children from their caregivers; we will have more to say about this below. Yet, in another sense, differentiation is also founded on real social and cultural differences between communities, nations, tribes, classes, castes, clans, status groups, age-grades, street-corner gangs, and ethnic groups. If you are Irish-American on St. Patrick’s Day in New York City, you march in the St. Patrick’s Day Parade. Americans, similarly, celebrate their “separation” or independence from Britain on Independence Day, July 4th. The French celebrate Bastille Day. Germany celebrates Unity Day; Italy marks Republic Day; and so on in Zimbabwe, Guernsey, Guam, and throughout the world. In short, social formations sustain their coherence in part through active differentiation from others.

Some developmental psychologists, clinical psychologists, self-psychologists, and analysts argue that differentiation has origins in the most primitive of our “defenses”—namely, in the splitting-and-projection

(or scapegoating) that is so obvious in children (“Mommy, I didn’t break the window! Bobby did!”) but appears everywhere and at all times in adults as well. This process is distress-dependent, that is, it occurs in proportion to the appearance of anxiety in a person or a community. Some of these differences are actively sustained by regular oppositionalism—by intermittent elections in democratic societies (Dahl, 1992), ritual confrontations between clans and other status groups in premodern societies (e.g., Gluckman 1954), the hierarchical repudiation of younger age groups by older groups (Eisenstadt 1967), street-corner gangs opposing one another for turf (Whyte 1969, Suttles 1968), and men in island societies following the traditional practice of kidnapping wives from adjacent islands (Malinowski 1929), etc. It is no surprise, therefore, that strain among groups in a community regularly accumulates, resulting in riots, gang wars, reprisals, and vendettas.

Now think of these examples as Durkheim might have. It might be said, to use Clifford Geertz’s expression (1973), that embodiment not only denotes but constitutes a “cultural system.” Durkheim’s (1995) approach to this subject, as Geertz fully understood, was to draw attention to the dynamics involved—to isolate oscillations between phases of profane and sacred life. Periods of profane life were periods of separation and differentiation, during which people fell out of synch with their encompassing communities. What this meant, in the neurosociological perspective, was that persons, for as long as they remained separated, lived with fewer interpersonal resources to serve their need to buffer and alleviate their anxieties. Viewed formally, this is a simple consequence of the attenuation of their social networks—the reduction in the number of active links to other stress-buffering persons or resources. Now, consider these observations in view of the infant-caregiver relationships. Both an infant’s attachment to a caregiver and separation from a caregiver replenish or service “depots” of endogenous chemicals that play a part in optimizing comfort and diminishing anxiety. Attachment stimulates the release of endogenous opioid peptides (EOPs, as they are called)—morphine-like neurochemicals whose effect is to soothe and calm the infant. Separation stimulates the noradrenergic (or “arousal”) system. Americans call it noradrenalin norepinephrine.) In infancy, these systems function inversely—that is, as one becomes active, the other shuts down. Since the brain becomes habituated to certain levels of activity in each of these systems, the shut-down of either system eventually produces discomfort that accumulates into “distress calls”—signals that, on the one hand, communicate to a mother that the baby needs to be picked up, caressed, fed, changed, or held, or, on the other hand, that the baby wants

to be put down, left alone for a time and allowed to explore the proximate environment, whether its crib or, later, the nursery. These behaviors reflect, respectively, the underlying needs for attachment and separation.

In optimally functioning families, oscillations between attachment and separation result in synchronized behavior; see (Pikiovsky et al. 2001, Strogatz 2003). Few things better illustrate how interconnected persons are physiologically than synchronization. It is the ultimate evidence of the embodiment of our physiology in networks. This is because synchronization results from the same anxiety-buffering that appears in attachment behavior. In the infant-caregiver dyad, distress is communicated back and forth. Sometimes, this results in a form of positive feedback, where the distress passed by the infant to the mother amplifies her distress, which, in turn, as it is passed back, amplifies the infant's. When the amount of stress exceeds the stress-buffering capacity of the mother, adjacent others are recruited to take up the burden of caregiving—fathers, grandparents, siblings, other relatives, even neighbors and friends. In larger systems of interaction, the same effect occurs; the spread of anxiety beyond dyads and small networks results in the recruitment of adjacent persons to serve an anxiety-modulating function. As distress continues to spread, it becomes a structure-generator. It expands networks, where the pressure toward synchrony grows in proportion to the anxiety circulating in them.

We see this effect in communities at every level of observation. When stressors appear—floods, hurricanes, upward fluctuations in local crime—the radius of communal activity constricts. In some Chicago neighborhoods, as Jane Jacobs (1961) observed, the mere presence of a stranger on the streets was enough to trigger calls to the police, and led residents to withdraw into their homes. As anxiety increases, communities contract into their smallest feasible circles of support and caregiving. This phenomenon is, of course, further evidence of the effects of the communication of distress—the solicitation of care and comfort on the part of those who are worried and anxious. The elderly, those confined to their homes by illness or infirmity, children left alone, and other vulnerable persons reach out for help, protection, and care—to citizen's patrols and neighborhood watches, police agencies, border patrols, volunteer fire department and ambulance services—in effect, to all so-called “emergency systems.” This, too, depends on synchronization.

Synchrony exhibits in no uncertain terms just how strongly persons are connected physiologically or, in other words, just how far embodiment itself extends beyond the single body to the bodies of others. Interestingly, this pattern relaxes as anxiety diminishes, only to be restored when anxiety

resurfaces. It is controlled, in other words, by an underlying biological oscillator—a physiological clock whose minutes are marked by attachment and separation, which are governed in turn by rhythms of distress and comfort.

A pattern so deeply established in social behavior, unsurprisingly, has deep physiological roots. Perhaps the most interesting of these reach into the immune system. The distinguished physiologist J. L. Blalock (1984, 2005) described the immune system as a “sixth sense.” By this, he means that our immune responses are akin to the body’s own sensory systems of sight, smell, hearing, pain, and touch. When we cut ourselves or fall and scrape a knee, the immune system responds by producing an analgesic response—the recruitment, first, of white blood cells and macrophages to the site of the injury (visible as their accumulation eventually causes edema and puffiness at the site), and thereafter in the recruitment of endogenous opioids, which have the analgesic effect of diminishing pain. For reasons probably only fully understandable in terms of our evolution as a species, this is directly analogous to the attachment mechanism in social life—to the recruitment of socially analgesic resources to persons exhibiting distress (see Smith and Stevens 1999). It is one of the many remarkable examples of the so-called “constancy of process across changes of scale” that we find in natural systems (see Prigogine and Stengers 1984 or Gleick 1987).

Culture enters our understanding of these dynamic features of social life because they are sustained at a macro-sociological level by cultural clocks—the most obvious being calendrical markers that call forth Durkheim’s communal oscillations. Seasonal rituals, initiation rites, and holidays (originally “holy days”) partition sacred from profane time, times of cultural renewal and social integration from times of separation, work, and individual occupation (see van Gennep 1908 for the classic analysis). One place this appears most visibly is in monasteries, where monks are called by bells to abandon their work and pray at regular intervals, even during the night when they are awakened from their sleep to go to chapel and pray (described, for example, by van Zeller 1958).

Yet the most famous illustration of how religion, anxiety, and culture are related first appeared in Max Weber’s analysis of the Protestant ethic (Weber [1904-1905] 1958), the model that developed from his understanding of Calvinism’s appearance first in Scotland and then in North America. Calvinist notions of predestination, Weber argued, did little to comfort adherents worried about salvation. The troubling question they lived with was whether they were among the “elect.” They sought signs of this by seeking rewards through hard work, in a pattern Weber

famously called “this-worldly asceticism.” This culturally driven pattern, of course, stood in striking contrast to the other-worldly asceticism of monasteries (ibid).

Rational bourgeois capitalism, in Weber’s analysis, grew step by step with the spread of the cultural pattern of this-worldly asceticism. Geertz (1972), in his seminal essays in *The Interpretation of Culture*, once thought of culture as a separate “level of analysis.” By this he had in mind the work of the American sociologist Talcott Parsons (e.g., 1950, Parsons and Shils 1952). Parsons theorized that “social systems” ought to be understood in view of a three-tiered conception of layered systems—personality system, social system, and cultural system. Each, thought Parsons, had its own units of analysis—whether memories, persons, beliefs, or other phenomena. Ultimately, in the subsequent critique and abandonment of Parsonsian thinking, the notion of independent levels of analysis dropped away. Even Geertz, probably the greatest anthropologist of his generation (and one of Parsons’ best students), stepped back from this kind of thinking after years of applying his great intelligence to the search for a solution to the problem—appropriating, for example, notions of symbolic action from Kenneth Burke (1945, 1950) and linguistic analysis from the philosophical writings of Suzanne Langer (1942, 1953). These were interesting and provocative forays into adjacent forms of “cultural analysis” but they failed to lead to a plausible conception of culture as a separate level of analysis.

However, to say that levels of analysis are not independent is not to say they do not exist. Consider our own bodies. Under normal conditions, for example, we are unaware of our respiration or heart rate—each stays under the control of physiological regulators and we remain unconscious of them. When we are frightened by something, this all changes. Suddenly we “feel” our bodies—we begin to perspire, our heart rate increases, our breathing becomes more rapid, and sometimes we even “hold our breath” so as to seem imperceptible to real or imagined predators or criminals. Sociologists and others used to think of this as part of an inborn fight-flight mechanism. Long a mainstay of physiological thinking, the fight-flight mechanism has also been re-specified by research undertaken in the 1980s and 1990s. Whereas fight-flight was once thought to be universal within the human species, the work of Shelly Taylor (1992) has shown that it is actually sex-differentiated. Whereas males will tend to band together to face a predator or enemy, women shift into a caregiving mode, manifesting what Taylor calls the “tending instinct.” Taylor, incidentally, speculates that this pattern has evolutionary origins—that it exists and has been transmitted because it improves the inclusive fitness of the species.

## **Nonlinear dynamics, self-organization, and emergentism**

Philosophers of science have occasionally reconstructed the problem of levels with a more general solution of their own (see, e.g., Nozick, 1981). Levels can be “causally eclipsed” from one another when the variations at lower levels of analysis are not absorbed by higher frequency dynamics at higher levels—as when, for example, we are not consciously aware of our physiology. When this causal eclipse is in place, vertical differentiation of levels remains stable in a system. A similar kind of partitioning is maintained when systems exhibit organization only under certain parameter conditions. Consider a system in which water molecules are contained between two horizontal plates, beneath the lower of which a heat source exists. When the temperature of the water remains below a certain threshold, the water molecules will show only Brownian motion, that is, random interaction. Raise the temperature slightly, and a convection current will appear. The molecules will rise from the lower plate where they have been heated, and cool as they move to the top plate, where they then fall back to the heat source and are again heated. A toroidal pattern of convection is established. But raise the temperature further, and chaos ensues. The water boils.

The appearance of convection is an example of self-organization. The relevance of this observation to our considerations here is that social interaction is also a self-organizing system. The analog to the heat source in interaction is anxiety. The mechanism involved is anxiety-spreading. At low levels of anxiety, persons will not be motivated to seek attachment from others. Managing their anxiety stays within their own stress-buffering capacities. But raise anxiety, and they will recapitulate the pattern seen in the infant-caregiver interaction—they will seek to spread their anxiety to others, looking for persons to “parent” them. Interaction, then, is like the convection current. The infant sends its distress signals upward to the parent, “heating” the interaction system, and the parent is moved to cool the system with attachment and care.

Before the advent of cheap high-speed computing, scientists ordinarily tried to model such phenomena in natural systems by disaggregating the systems into small parts that could be fitted by linear models. Examining the sequence of slope coefficients of each line, they would emerge with a picture of a curvilinear function. This was one way of approximating a system’s complexity (complexity was thought to mark a system when it was not susceptible to linear decomposition [on complexity, see, for example, Waldrop 1992 and Strogatz 1994, 2003]), but very few natural systems—biological, social, or physical—are linear in their composition.

Modeling even the relatively simple toroidal movement of water molecules requires a system of nonlinear differential equations. With modern computing, such systems became tractable mathematically and have been extensively studied. We also now know that some nonlinear systems, including social interaction, are marked by catastrophes—by sudden disjunctive shifts in their organization. Avalanches are the classic example of catastrophes in the natural world; an infant's sudden disjunctive shift from attachment to a caregiver to separation is another (for catastrophe theory, see Zeeman 1976 and Poston and Stewart 1978).

This kind of theoretical insight into attachment behavior should also have appeared in the formal study of social interaction, but so far, it has not. The predominant empiricism of American sociologists has led them away from such pure theoretical exercises. But the fact remains that interaction is not an additive phenomena. It is what scientists and philosophers of science, in studying natural systems, describe as a system marked by non-aggregativity. In the previous century, the study of non-aggregative systems in sociology was closely aligned to the so-called micro-macro problem. Related to the contested issues surrounding the study of “levels of analysis,” the micro-macro problem centered on whether it was possible to move seamlessly from an analysis of the behavior of individuals to an analysis of groups and institutions. James Coleman (1963, 1990), one of the great mathematical sociologists of the 1900s, approached this problem with a critique of Parsons’ layered conception of social systems, discussed above. Coleman argued that it was theoretically misleading to attribute “principles of action” to entities such as groups of institutions. Groups did not act; persons did. Repudiating “functionalist” analysis, he turned to economics and so-called rational choice theory as an alternative starting point for theory building. Here his theoretical endeavors failed for he found in the arguments of rational choice theorists no plausible empirical bridge from individuals to groups.

What were the alternatives?

### **Fashion, sports, and exclusivity: Differentiation and dominance contests**

In the work of classic social theorists in the previous centuries, models of difference and differentiation flourished. Marx’s analysis of class conflict (1964, 1967) is probably the most famous; Simmel’s analyses of webs of group affiliations and of fashion are others. Simmel (1950, 1955) showed how the dynamics of fashion depended on social differentiation. In his mind, the European societies of the 19th century were marked by



strongly entrenched class and status groups. In these societies, fashions tended to originate from among the elite. Imitations then passed down the status hierarchy. When each higher status group found itself imitated, it would repudiate the imitated faction and subsequently adopt others to sustain their separation from social inferiors. Imitation was the equivalent of attachment; differentiation was the equivalent of separation.

Each of these acts of imitation and differentiation served to reconstruct the existing order of status groups. Construction and reconstruction, as processes of integration, are also central to an individual's personal sense of self. In the research tradition that has grown up around the study of "autobiographical memory," for example, we find another example of how culture—in this case "personal culture"—depends on social interaction (Barclay and Smith 1991). Autobiographical memory—indeed, all memory—is reconstructed. Memories are not simply retrieved from storage. Memory is also among the most heavily studied aspects of the mind. In a typical study of the memory, the subject is asked to memorize a list of words or a series of pictures of faces and then to recall or recognize the material under various conditions.

However, both the perceptions of memory by the general public as well as the traditional ways of conducting research into memory have very little to do with the way memory operates in real life. In most real life situations, we store and recall information as a prerequisite for solving a problem at hand. Furthermore, certain memories are accessed and retrieved not in response to an external command coming from someone else but rather in response to an internally generated need. Instead of being told what to recall, I have to decide which information is useful to me in the context of my ongoing activities at the moment. The things people remember in everyday life include a great variety of different items such as, for example, remembering a shopping list or a recipe, remembering to telephone a relative or fill up the car with petrol, recounting the arguments put forward at a meeting or the plot of a play seen on television, or remembering the amount of a bill that has to be paid. All these experiences are embedded in a rich context of ongoing events and scenes; they are influenced by a lifetime of past experiences, history and culture, current motives and emotions, intelligence and personality traits, and future goals and plans. It is probably impossible to take all these factors into account but everyday memory research does recognize the importance of the context in which an event occurs.

Researchers exploit the way that reinstating the context can facilitate retrieval. Research into everyday memory also emphasizes the fact that remembering usually occurs in a social context. Most real life acts of

memory recall involve deciding what type of information is useful to us at the moment and then selecting that information from the totality of the available knowledge. People remember details of an event they witnessed when they are reminded of aspects of the context such as the scene, or the preceding or succeeding events. Memory is not just a private databank; it is shared, exchanged, constructed, revised, and elaborated in all our social interactions. Memory in the real world (Cohen 2008, 1–20) is often known as everyday memory; it is concerned with the memory used as people go about their daily lives. Research puts emphasis on the functional aspect of memory. Memory, then, is viewed as part of a repertoire of behavior designed to fulfill specific goals. For example, autobiographical memory functions in order to build and maintain personal identity and concept of the self; prospective memory functions to enable the individual to realize plans and intentions; spatial memory functions so that the individual can navigate the environment, and so on. Bruce (1985) stated that research into ecological memory must ask how memory operates in everyday life, identifying causes and processes; what functions does it serve and why has it evolved both ontogenetically and phylogenetically in this way? Everyday memory is context-bound and not context-free.

Today, memory is conceived as a complex and diffuse mental faculty that does not reconstruct the past faithfully but instead is responsible for a continuing process producing individual memories, which depend on the meaning ascribed and the emotions linked to the embodied experiences of the individual. This is true above all when the events are important for one's sense of self (autobiographical memory), in conferring uniqueness to one's own life (Schacter 2001). Thus, we can state that the approach currently dominant in memory studies is "constructivist in nature" (Assmann 2006), and it has been supported by the evolution that has taken place in the neurosciences themselves, although substantial differences can be found when comparing the subjective and social levels of memory.

Moreover, the locus of this reconstruction is typically social. At family reunions or during tribal rituals, groups repeat, and sometimes reenact, narratives of their past—in each case reconstructing the "story" of their origins. A well-known example of this reconstruction in family life appears when relatives join together on holidays and tell stories of their shared history, or when husbands and wives, asked to talk about their marriage, jointly contribute part of the narrative, each completing the other's sentences. The "story" or narrative is the important agent of integration here. Telling the story reconnects a husband and a wife, just as celebrating other "origin myths" reunites communities, tribes, and nations. Without the story, there is a danger of fragmentation—the slow loss of

synchrony that Durkheim saw in unrelieved “profane” activity. Communal occasions in all societies also depend on establishing differences through competition. Athenian athletes competed at throwing the discus or running marathons; they were engaged in what we today would describe as “contest systems” (Gouldner 1966). Contest systems were “dominance contests.” The winner was the best—the person whose behavior became a model of what it was to be worthy of deference. Such a model became part of Greek culture—a model others could seek to emulate. Contests between the city-states, similarly, also established dominance orders and led to alliances that helped sustain the political stability of the Eastern Mediterranean.

All modern sports yield comparable models of deference, and all establish dominance hierarchies. While the winning competitor or team creates heroes for their followers, their level of performance also produces “records” that subsequent competitors aim to break. In other words, where there is a dominance hierarchy, there is always a standard in place. In societies without fully integrated cultural systems, sports arenas and stadiums have become the cathedrals of their time. They provide something to worship where religions have weakened.

This state of cultural failure had become common by the late 18th century throughout European societies. Old models of what it meant to be a gentleman, for instance, no longer fit the lives men led. This vacuum in standards of excellence led to a marketplace for new models, where men competed to establish themselves as “heroes of style.” The most famous of these was Beau Brummel, the “dandy” whose apartments in London even the Prince Regent would visit in the late mornings to witness Brummell’s toilette (Smith 1974). Subsequent followers in the dandy tradition were Baudelaire, Oscar Wilde, and numerous 20th-century persons who sought distinction through their dress and deportment.

Today it is movies, theater, and television that elevate actors and actresses to similar fame. Some become anti-heroes, the villains and traitors of our time, and others become the comic figures, the Charlie Chaplins and Margaret Rutherfordes who find humor in otherwise everyday events. Jokes and humor have always been ways to relieve stress. In premodern societies, “joking relationships” have been described by anthropologists between uncles and nephews and others.

It is a measure of how societies make use of status differences to sustain patterns of social organization that they provide occasions for persons to move outside their own everyday identities. To do so brings each person into the perspectives of others, as when paupers become princes and kings are reduced to ordinary citizens. Even in relatively

unchanging premodern societies, we find examples of men and women shifting identities. Shifts in identity also accompany other ritual occasions, where men “become” totemic figures. In some places, trance-like behavior appears, during which men merge dissociatively into myths or engage in acts that are symbolic assaults on the status order, as when tribesmen among the Zulu would throw filth at their sacred king. These “inversions of the moral order” (Polanyi 1958, Callois 1961) functioned to alleviate the stress that accumulated during profane periods.

## Conclusion

Embodiment and culture are our themes in this volume, but as our observations in this introduction indicate, they carry us across a diverse terrain. They are fundamental, for example, to understanding the dynamics of many sectors in the modern economy—from the fashion system to patterns of innovation and imitation in entrepreneurship.

Out of time, out of mind—literally. Without simultaneity of activation, problems are compounded. If there is an attempt to orchestrate more than one sense modality, we could never play a musical instrument because what we hear and what we feel in our fingers would never match. We would be unable to enunciate words or ride a bicycle. In short, without coordinated simultaneity of activation, the binding of activity of the various sensory systems into perceptual unity would be impossible, and the self would be left fragmented.

Things change. What is important one day may not be the next, and so conflicting messages occur. The result is that consensus truth about the global—even local—state of affairs is neither complete nor stable. There are those going and those coming; those who turn back and those who want to lead others at all costs: women, children, and men trying to reach a bond in the midst of the differences distinguishing each human from the other. To meet their basic needs, animals must fight to conquer their prey, while they are also prey to other animals. In fact, war and power are the dominant instincts for them as well. We distinguish ourselves from animals, however, because we have been able to produce cultural memory through the ages as a connecting structure of the social bond. As old as the history of *homo sapiens*—and as variable as each phase specifying evolution over time and its relative action contexts—this bond constructs the measure of use and exchange, which lay the foundations of cultural diversity. We must turn to this bond to respond to the political demand for freedom and humanity coming from the hundreds of thousands of naked bodies amassed in boats, lined up in front of a fence, and camped at a

station, waiting for a European-bound train. The aim of the present book is, for instance, to outline, by the embodiment, what we know of cultural difference. The authors and editors believe that an analysis at the sociological level will prove valuable in throwing light on accounts of human behavior at the interpersonal and social levels, and will play an important role in our capacity to understand the physical factors that underpin various types of behavior. The essays in this volume bear witness to these themes and we invite the reader to follow them across the pragmatic terrain explored by our contributors. This book is, therefore, an ideal resource for advanced and postgraduate students in social sciences as well as practitioners in the field of Information and Communication technologies. Scholarly and accessible in tone, the book *Embodiment and Cultural Difference* will be read and enjoyed by members of the general public and followers.

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