ARMIN W. GEERTZ

TOO MUCH MIND AND NOT ENOUGH BRAIN, BODY AND CULTURE
ON WHAT NEEDS TO BE DONE IN THE COGNITIVE SCIENCE OF RELIGION[1]

Abstract

This article is based on work conducted at a research unit that I head at Aarhus University called Religion, Cognition and Culture (RCC). It was originally designated as a special research area by the Faculty of Theology at the University and has since been integrated as a full-fledged research unit in the Department of the Study of Religion[2]. In a recent statement by the RCC, we claim that humans are simultaneously biological and cultural beings. In all of hominin history, human biology and culture have never been separate. Each newborn infant is both unfinished and uniquely equipped, biologically and cognitively organized to flourish in socio-cultural environments that its genes could never anticipate. So a perspective on minds not limited to brains is required. Thus we must approach cognition as embodied and distributed. We must analyze religion by studying the functional organization of the human brain, its interaction with the social and cultural worlds that it inhabits and modifies, and its developmental constraints and flexibility. The RCC is a European institution, obviously. It differs in its approach to cognition from the few institutions in the United States, England and Northern Ireland that deal with cognition and religion. Whereas the RCC is similar in approach to other European initiatives such as the cognition group in Groningen and the research project in Helsinki. Therefore it could be claimed that our programmatic insistence on causal links between religion, cognition and culture is a peculiarly European approach. In the following, I will explain how the cognitive science of religion can become more relevant to the comparative study of religion and to cutting-edge cognitive science by following this European approach.

[1] This article is a highly edited version of my keynote lecture presented at the EASR meeting in Messina in 2009 entitled *Religion, Cognition and Culture: A European Idea?*.

[2] The RCC is closely integrated with the university-wide conglomerate in Aarhus, known as MIND*Lab*, as well as the Center for Functionally Integrative Neuroscience (CFIN), and the Cognition, Communication, and Culture (CCC) network, all consisting of researchers from the humanities, social sciences, natural sciences, health sciences, the university hospitals and the psychiatric hospital.

Introduction

The recent success of and growing interest in the cognitive science of religion (CSR) indicates that it has a lot of potential not only for the comparative study of religion but also for the cognitive neurosciences. Despite these successes, we should not be blind to the fact that a number of challenges must be overcome in order to ensure future growth in the field. My own list of challenges, idiosyncratic as it may be, looks like this:

- accommodating current breakthroughs in the social neurosciences
- bringing deficient methodological paradigms to terms with cutting edge philosophy of science
- obtaining both cross-cultural and ecological validity of current psychological hypotheses
- broadening perspectives and theories to accommodate the accumulated knowledge and breakthroughs in the comparative study of religion
- broadening perspectives and theories to accommodate the accumulated knowledge and breakthroughs in semiotics, history, literature and linguistics
- recruiting young scholars, especially women scholars, and encouraging exchange between the few cognitive science of religion centers and research units that exist in the world

In a word, current cognitive science of religion is too much mind and not enough brain, body and culture[3]. It is swiftly becoming esoteric in

[3] Cf. ARMIN W. GEERTZ. *Cognitive approaches to the study of religion*, in *New Approaches to the Study of Religion.* Volume 2. *Textual, Comparative, Sociological, and Cognitive Approaches*, edited by Peter Antes, Armin W. Geertz, Randi R. Warne, Berlin, Walter de Gruyter, 2004. pp. 347-399; ID.. *Religion and cognition: A crisis in the academic study of religion?*, «Bulletin of the Council of Societies for the Study of Religion» XXXVII, 2008, 4, pp. 91-95; JEPPE SINDING JENSEN, *The complex worlds of religion: Connecting cultural and cognitive analysis*, in *Current Approaches in the Cognitive Science of Religion*, edited by Ilkka Pyysiäinen, Veikko Anttonen, London & New York, Continuum, 2002, pp. 203-228; ID., *Religion as the unintended product of brain functions in the "standard cognitive science of religion model": On Pascal Boyer, Religion Explained (2001) and Ilkka Pyysiäinen, How Religion Works (2003)*, in *Contemporary Theories of Religion: A Critical Companion*, edited by Michael Stausberg, Abingdon & New York, Routledge, 2009, pp.

the sense that many studies are coming out now which are exclusively and narrowly concerned with proving the hypotheses of an earlier generation of CSR pioneers and are thus failing to pay attention to current trends in cognate sciences. A significant portion of the CSR is caught in a limbo, as it were, of its own choosing, by methodologically ignoring neural correlates on the one hand and cultural constraints on the other. Thus, many of its results are disembodied, disembrained and disencultured.

I am firmly convinced, however, that we need more scholars of religion to participate in the cognitive science of religion. If we don't, then psychologists, anthropologists and neurologists will do it for us. I, for one, am not satisfied with simply ignoring the challenges that the cognitive sciences present to the comparative study of religion. Our colleagues in the cognitive science of religion deserve a much more qualified response than they have been getting from some quarters.

Unfortunately, research on this perhaps most important aspect of the study of religion is seriously hampered on all sides for a variety of reasons. What one would assume to be the closest and most relevant discipline in the study of human cognition, namely psychology, has been of little assistance. Either religion is not considered to be a serious area of research or those who do pursue the psychology of religion often do so for religious or spiritual reasons which clearly influence the kinds of questions asked, the people studied and the conclusions drawn. Furthermore, the results are based on American and, when comparative, European, mainly Christian and Judaic, populations[4]. And, as Henrich and colleagues' humorous title indicates, these are simply the WEIRDest people in the world (Western, Educated, Industrialized, Rich and Democratic)[5].

On the other hand, cultural psychology[6] and the social psychology of

---

129-155; JASPER SØRENSEN, *Religion, evolution, and an immunology of cultural systems*, «Evolution and Cognition» X, 2004, 1, pp. 61-73.

[4] DAVID M. WULFF, *Psychology of religion: An overview*, *in Religion and Psychology: Mapping the Terrain. Contemporary Dialogues, Future Prospects*, edited by Diane Jonte-Pace, William B. Parsons, London, Routledge, 2001, pp. 15-29.

[5] JOSEPH HENRICH, STEVEN J. HEINE, ARA NORENZAYAN (in press), *The weirdest people in the world?*, in *Behavioral and Brain Sciences*.

[6] DAVID MATSUMOTO, LINDA JUANG, *Culture and Psychology. Fourth Edition*. 4 ed. Belmont, Thomson Wadsworth, 2004; reprint, Belmont, Thomson Wadsworth, 2008.

culture[7] are still somewhat new, and their results, interesting as they are, do not address religion. Similarly, our anthropological colleagues who are interested in psychology (not counting cognitive anthropologists here because they are central actors in the CSR) are often not interested in religion. There are exceptions of course, such as the anthology on learning religion indicates[8].

The psychological discipline that comes closest to the interests and goals of the CSR calls itself the «empirical psychology of religion»[9]. These studies tell us a lot about religious psychology, although oftentimes hampered by exclusive emphasis on American populations. Attempts are being made, however, to expand experimental populations to non-Western areas. These attempts have their problems, too, such as the exaggerated stereotyping of "Western" and "Eastern" psychologies.

In the cognitive sciences, there is little interest in religion. A growing interest, however, is occurring in the neurosciences. There are many problems with most of these studies. First, neuroscientists have a tendency to assume that religious thinking and behavior are monolithic. Their generalizations, furthermore, are often based on their own particular religious background or on the American context. A significant number of neurologists studying religion are often driven by a desire to find special areas of the brain dedicated to religious thought and behavior. These scientists clearly have religious or spiritual agendas[10]. Often, one finds attempts at objectivity in their scientific articles, but these are blatantly offset by popularizing books claiming secure knowledge about the brain and religion, for which there is, of course,

---

[7] CHI-YUE CHIU, YING-YI HONG, *Social Psychology of Culture*, New York & Hove, Psychology Press, 2006.

[8] *Learning Religion: Anthropological Approaches*, edited by David Berliner, Ramon Sarró, New York & Oxford, Berghahn Books, 2007.

[9] Cf. BENJAMIN BEIT-HALLAHMI, MICHAEL ARGYLE, *The Psychology of Religious Behaviour, Belief and Experience*. London, Routledge, 1997; RALPH W. HOOD JR., PETER C. HILL, BERNARD SPILKA, *The Psychology of Religion: An Empirical Approach. Fourth Edition*. 4th ed. New York & London, The Guilford Press, 2009 and *Handbook of the Psychology of Religion and Spirituality*, edited by Raymond F. Paloutzian, Crystal L. Park, New York & London, The Guilford Press, 2005.

[10] ARMIN W. GEERTZ, *When cognitive scientists become religious, science is in trouble: On neurotheology from a philosophy of science perspective*, «Religion» XXXIX, 2009, pp. 319-324.

no empirical backing. A clear example of this is Andrew Newberg. Comparing his balanced and objective chapter *Religious and spiritual practices: A neurochemical perspective*[11] with his recent book *How God Changes Your Brain*[12], it is clear that in the latter, Newberg is pandering to the pop spiritual market in the U.S. Finally, many of the neurological studies are poorly designed and/or are based on such small numbers of participants that the results can at best only tell us something about those particular participants[13].

During the past few years, neurological studies on religion have increased significantly. Interesting as they may be, there are very few scholars of religion involved in them[14]. There are never the less quite

[11] ANDREW B. NEWBERG, *Religious and spiritual practices: A neurochemical perspective*, in *Where God and Science Meet: How Brain and Evolutionary Studies Alter Our Understanding of Religion*. Volume 2. *The Neurology of Religious Experience*, edited by Patrick McNamara, Westport & London, Praeger Publishers, 2006, pp. 15-31.

[12] ANDREW B. NEWBERG, MARK ROBERT WALDMAN, *How God Changes Your Brain: Breakthrough Findings from a Leading Neuroscientist*, New York, Ballantine Books, 2009; reprint, New York, Ballantine Books, 2010.

[13] Such is the case with MARIO BEAUREGARD, VINCENT PAQUETTE, *Neural correlates of a mystical experience in Carmelite nuns*, «Neuroscience Letters» 405, 2006, pp. 186-190; H. BENSON, M.S. MALHOTRA, R.F. GOLDMAN, G.D. JACOBS, *Three case reports of the metabolic and electroencephalographic changes during advanced Buddhist meditation techniques*, «Behavioral Medicine» XVI, 1990, 2, pp. 90-95; S.W. LAZAR, G. BUSH, R.L. GOLLUB, G.L. FRICCHIONE, G. KHALSA, H. BENSON (2000), *Functional brain mapping of the relaxation response and meditation*, «NeuroReport» XI, 1991, 5, pp. 1581-1585; ANDREW NEWBERG, A. ALAVI, M. BAIME, M. POURDEHNAD, J. SANTANNA, E. D'AQUILI, *The measurement of regional cerebral blood flow during the complex cognitive task of meditation: A preliminary SPECT study*, «Psychiatry Research: Neuroimaging» 106, 2001, pp. 113-122; ANDREW B. NEWBERG, M. POURDEHNAD, A. & E. D'AQUILI, *Cerebral blood flow during meditative prayer: Preliminary findings and methodological issues*, «Perceptual and Motor Skills» LXCVII, 2003, 2, pp. 625-630; ANDREW B. NEWBERG, NANCY A. WINTERING, DONNA MORGAN, MARK R. WALDMAN, *The measurement of regional cerebral blood flow during glossolalia: A preliminary SPECT study*, «Psychiatry Research: Neuroimaging» 148, 2006, pp. 67-71. See UFFE SCHJØDT, *The religious brain*, «Method and Theory in the Study of Religion» XXI, 2009, 3, pp. 310-339; UFFE SCHJØDT, *Homeostasis and religious behaviour*. «Journal of Cognition and Culture» 7, 2007, pp. 313-340.

[14] Exceptions are UFFE SCHJØDT, HANS STØDKILDE-JØRGENSEN, ARMIN W. GEERTZ, ANDREAS ROEPSTORFF, *Rewarding prayers*, «Neuroscience Letters» 443, 2008, pp. 165-168; UFFE SCHJØDT, HANS STØDKILDE-JØRGENSEN, ARMIN W. GEERTZ, ANDREAS ROEPSTORFF, *Highly religious participants recruit areas of social cognition*

a number of interesting studies worthy of our attention[15].
It is quite clear from studies not restricted to religious ideas and behavior, that human cognition is embodied, embrained and encultured – deeply so on all three counts[16]. Thus the putative cognitive constraints, systems and domains proclaimed by many CSR researchers have a peculiar or even metaphysical ring to them. Is HADD, for instance,

---

in personal prayer, «Social Cognitive and Affective Neuroscience» 4, 2009, pp. 199-207; UFFE SCHJØDT, HANS STØDKILDE-JØRGENSEN, ARMIN W. GEERTZ, TORBEN E. LUND, ANDREAS ROEPSTORFF, *The power of charisma – perceived charisma inhibits the frontal executive network of believers in intercessory prayer*, «Social Cognitive and Affective Neuroscience» 2010 (in press); NINA P. AZARI, JANPETER NICKEL, GILBERT WUNDERLICH, MICHAEL NIEDEGGEN, HARALD HEFTER, LUTZ TELLMANN, HANS HERZOG, PETRA STOERIG, DIETER BIRNBACHER, RÜDIGER SEITZ, *Neural correlates of religious experience*, «European Journal of Neuroscience» 13, 2001, pp. 1649-1652; NINA P. AZARI, *Neuroimaging studies of religious experience: A critical review*, in *Where God and Science Meet: How Brain and Evolutionary Studies Alter Our Understanding of Religion*. Volume 2. *The Neurology of Religious Experience*, edited by Patrick McNamara, Westport & London, Praeger Publishers, 2006, pp. 33-54.

[15] Here are some interesting examples: LORENZA S. COLZATO, WERY P. M. VAN DEN WILDENBERG, BERNHARD HOMMEL, *Losing the big picture: How religion may control visual attention*, «PLoS ONE» III, 2008, 11, pp. 1-3; SHIHUI HAN, LIHUA MAO, XIAOSI GU, YING ZHU, JIANQIAO GE & YINA MA, *Neural consequences of religious belief on self-referential processing*, «Social Neuroscience» 3, 2007, 1, pp. 1-15; SAM HARRIS, JONAS T. KAPLAN, ASHLEY CURIEL, SUSAN Y. BOOKHEIMER, MARCO IACOBONI, MARK S. COHEN, *The neural correlates of religious and nonreligious belief*, «PLoS ONE» 4, 2009, 10, pp. 1-9; DIMITRIOS KAPOGIANNIS, ARON K. BARBEY, MICHAEL SU, FRANK KRUEGER, JORDAN GRAFMAN, *Neuroanatomical variability of religiosity*, «PLoS ONE» 4, 2009, 9, pp. 1-7; OSAMU MURAMOTO, *The role of the medial prefrontal cortex in human religious activity*, «Medical Hypotheses» 62, 2004, pp. 479-485; Ara Norenzayan, Azim F. Shariff, *The origin and evolution of religious prosociality*, «Science» 322, 2008, pp. 58-62; FRED H. PREVIC, *The role of the extrapersonal brain systems in religious activity*, «Consciousness and Cognition» 15, 2006, pp. 500-539; JEFFREY L. SAVER, JOHN RABIN, *The neural substrates of religious experience*, «Journal of Neuropsychiatry and Clinical Neurosciences» 9, 1997, 3, pp. 498-510; KATJA WIECH, MIGUEL FARIAS, GUY KAHANE, NICHOLAS SCHACKEL, WIEBKE TIEDE, IRENE TRACEY, *An fMRI study measuring analgesia enhanced by religion as a belief system*, «Pain» 139, 2008, pp. 467-476; YANHONG WU, CHENG WANG, XI HE, LIHUA MAO & LI ZHANG (2010), *Religious beliefs influence neural substrates of self-reflection in Tibetans*, «Social Cognitive and Affective Neuroscience» (in press), pp. 1-8.

[16] See *Foundations in Social Neuroscience*, edited by John T. Cacioppo et al., Cambridge, The MIT Press, 2002.

what Justin Barrett claims it to be[17], or are there several distinct brain processes with differing functions at play? We cannot know this until we identify the neural correlates and brain areas that might be active. There is a growing literature on the neural correlates of pattern recognition, theory of mind and movement response, which must be taken into consideration before the HADD hypothesis can be adequately tested. But even if we are more or less sure about the neural correlates, it cannot be said that we have discovered task-specific or dedicated systems. This is because brain regions are multi-purpose and the only proven modules of the brain are dedicated to the sensory-motor system[18].

Furthermore, what cultural mechanisms are involved in transforming these brain activations into ideas about religiously significant supernatural beings? Since Barrett's research relies heavily on Pascal Boyer's work, there is no clear answer to this question. Boyer speaks of the Mickey Mouse problem[19], but he has not solved it. He simply states that God is more important than Mickey Mouse because he is a strategic agent, which explains nothing much especially when the causal role of culture in cognition is methodologically denied, as in Boyer's case.

Just because the standard cognitive science of religion is too mentalistic, computational, scientistic, ahistorical and culture-blind does not mean that we should give it up. The standard study of religion is hardly any better, but we keep plodding away at it nonetheless. Our field is too textualistic, culturalistic, anti-scientific, anti-theoretical, mind blind and covertly speculative. Much of the history of the study of religion is also esoteric. It has often thrived on unenlightened notions of science and the scientific process of discovery. Furthermore, many scholars of religion ignore humans. They are more often interested in religious ideas and religious rituals, but not in what motivates people to think and act as they do in their everyday lives, as well as in

[17] JUSTIN L. BARRETT, *Exploring the natural foundations of religion*, «Trends in cognitive sciences» 4, 2000, pp. 29-34.

[18] LAWRENCE W. BARSALOU, *Perceptual symbol systems*, «Behavioral and Brain Sciences» 22, 1999, pp. 577-660.

[19] PASCAL BOYER, *Functional origins of religious concepts: Ontological and strategic selection in evolved minds*, «The Journal of the Royal Anthropological Institute» 6, 2000, 2, pp. 195-214: pp. 202, 208.

ritual circumstances. It is simply assumed that they are motivated by religious intentions. But in order to understand human motivation, you need to understand human psychology and cognition. I am afraid that without the cognitive science of religion as a legitimate and important part of the general and comparative study of religion, then the comparative study of religion will remain a half science[20].

People feel, think, act and symbolize. Pascal Boyer noted succinctly in his first book *Tradition as Truth and Communication* that scientific disciplines dealing with cultural traditions need strong psychological hypotheses before they can competently deal with tradition and the transmission of tradition.[21] It strikes me as self-evident that the ideal approach is a combination of psychological, neurobiological and socio-cultural theories, methods and hypotheses. Furthermore, there are very good reasons for scholars of religion to take the lead. As I wrote in my contribution to the Online Conference on Religious Studies hosted by the Moscow Society for the Study of Religions, 2008:

> If we don't take up the challenge, then the cognitive science of religion will be run exclusively by neurologists (many of whom are asking for help from the human sciences), psychiatrists (with many disturbing and important observations), experimental psychologists (with interesting results in their dealings with people), anthropologists (our friendly competitors in the comparative study of religions), and philosophers (challenging us on our methodological ploys and theoretical assumptions). Furthermore, we will be leaving by default all the hard work of writing popularizing literature on this extremely important topic to authors like Daniel Dennett and Richard Dawkins (with the result that people who don't like them, won't like us either)[22].

[20] See my response to Michael Pye (from which this paragraph is taken) in the 2nd International Online Conference on Religious Studies (Moscow Society for the Study of Religions, 2008) on the theme "*Comparative Religion: from Subject to Problem*. http://e-religions.net/2008/index.php?lng=en

[21] PASCAL BOYER, *Tradition as Truth and Communication: A Cognitive Description of Traditional Discourse*, Cambridge, Cambridge University Press, 1990, pp. viii-ix.

[22] ARMIN W. GEERTZ, *Comparative religion and cognitive science: Why should they meet?*, «RELIGIO: Bulletin of the Moscow Society for the Study of Religions» 2, 2009, p. 3; ID., *New atheistic approaches in the cognitive science of religion: On Daniel Dennett,* Breaking the Spell *(2006) and Richard Dawkins,* The God Delusion *(2006)*, in *Contemporary Theories of Religion: A Critical Companion*, edited by Michael Stausberg, Abingdon & New York, Routledge, pp. 242-263.

A better understanding of cognition

The CSR pioneers understand cognition as being more or less exclusively a mental phenomenon. Lawson & McCauley[23] as well as Boyer[24] are concerned with cognitive representations and how they are reproduced. Boyer speaks of cognitive constraints, intuitive domains and counterintuitive concepts. Whitehouse bases his work on types of memory and the role they play in cognitive representations[25]. Dan Sperber in his epidemiological account is concerned with two types of representations, mental representations and public representations[26]. Justin Barrett in some of his work, is concerned with counterintuitive representations or concepts[27].

As Paul Thagard has shown, there are six competing approaches to cognition that are based on computer analogies of the brain[28]. These ideas are based on the «physical symbol system hypothesis» in artificial intelligence research which basically assumes that the brain is analogous to a Turing machine. The latter is not generally held by neurologists today. As Gerald Edelman argued already in 1992, brains possess far too much individual variation at various organizational levels to be specified in the genome. The enormous ecological and environmental variation at play here «makes it unlikely that the world

---

[23] E. THOMAS LAWSON, ROBERT N. MCCAULEY, *Rethinking Religion: Connecting Cognition and Culture*, Cambridge, Cambridge University Press, 1990; ROBERT N. MCCAULEY, E. THOMAS LAWSON, *Bringing Ritual to Mind: Psychological Foundations of Cultural Forms*, Cambridge, Cambridge University Press, 2002.

[24] PASCAL BOYER, *The Naturalness of Religious Ideas: A Cognitive Theory of Religion*. Berkeley, Los Angeles, London, University of California Press, 1994; ID., *Religion Explained: The Evolutionary Origins of Religious Thought*, New York, Basic Books, 2001.

[25] HARVEY WHITEHOUSE, *Inside the Cult: Religious Innovation and Transmission in Papua New Guinea*, Oxford, Oxford University Press, 1995; ID., *Arguments and Icons: Divergent Modes of Religiosity*, London & New York, Oxford University Press, 2000.

[26] DAN SPERBER, *Explaining Culture: A Naturalistic Approach*, Oxford, Blackwell Publishers, 1996.

[27] JUSTIN BARRETT, FRANK C. KEIL, *Conceptualizing a nonnatural entity: Anthropomorphism in god concepts*, «Cognitive Psychology» 31, 1996, pp. 219-247; JUSTIN L. BARRETT, MELANIE A. NYHOF, *Spreading non-natural concepts: The role of intuitive conceptual structures in memory and transmission of cultural materials*, «Journal of cognition and culture» 1, 2001, 1, pp. 69-100.

[28] PAUL THAGARD, *Mind: Introduction to Cognitive Science*, Cambridge & London, The MIT Press, 1996, p. 128.

(physical and social) could function as a tape for a Turing machine»[29]. A second problem is the fact that human minds are characterized by having semantic contents, i.e. of producing meaning and not just mechanical syntax. In drawing on Searle, Edelman argues that meaning is interactional. The environment in this context plays a causal role in the production of meaning. Furthermore, the body plays a causal role in the production of meaning. In other words, nervous system response patterns «depend on the individual history of each system, because it is only *through interactions with the world* that appropriate response patterns are selected»[30]. Many other neurologists have also taken issue with the cognitivist analogy of human cognition as a computer, such as Terrence W. Deacon[31], Chris Frith[32], Joaquín M. Fuster[33] and others.

In his book *The Meaning of the Body* (2007), Mark Johnson rejects the philosophies of cognition and mind that build on a mental representational theory based on concepts and propositions. He rightly argues that our cognition is radically embodied in sensorimotor processes, and so is the process of meaning-making. «Meaning», he claims, «emerges, lives, and grows [...] in the bodily processes [....] Embodied meaning [...] emerges as structures of organism-environment interactions or transactions»[34]. In this he has strong support from the work of Lawrence Barsalou[35], Vittorio Gallese[36] and many others. Johnson

[29] GERALD M. EDELMAN, *Bright Air, Brilliant Fire: On the Matter of the Mind*, New York, BasicBooks, 1992, p. 224.

[30] *Ibi*, p. 226.

[31] TERRENCE W. DEACON, *The Symbolic Species: The Co-Evolution of Language and the Human Brain*, London, Allen Lane The Penguin Press, 1997.

[32] CHRIS FRITH, *Making Up the Mind: How the Brain Creates Our Mental World*, Oxford, Blackwell Publishing, 2007; ANDREAS ROEPSTORFF, CHRIS FRITH & UTA FRITH, *How our brains build social worlds*, «New Scientist» 2737, 2009, pp. 1-3.

[33] JOAQUÍN M. FUSTER, *Cortex and Mind: Unifying Cognition*, Oxford, Oxford University Press, 2003.

[34] Johnson 2007, p. xii.

[35] BARSALOU, *Perceptual symbol systems*; LAWRENCE A. BARSALOU, *Situated simulation in the human conceptual system*, «Language and Cognitive Processes» XVIII, 2003, 5/6, pp. 513-562; LAWRENCE W. BARSALOU, KAREN OLSETH SOLOMON, LING-LING WU, *Perceptual simulation in conceptual tasks*, in *Cultural, Typological, and Psychological Perspectives in Cognitive Linguistics: The Proceedings of the 4th Conference of the International Cognitive Linguistics Association*, vol. 3, edited by M. K. Hiraga, C. Sinha & S. Wilcox, Amsterdam, John Benjamins, pp. 209-228.

argues emphatically: «Without a brain, there is no meaning. Without a living, acting body – no meaning. And without organism-environment interaction – no meaning»[37].
Our interactions with the world, especially the social world, has been forcefully argued by neuropsychologist Merlin Donald:

> We are culture-mongers, driven by the very nature of our awareness to seek refuge and solace in community. We connect with and learn from others to a unique degree. Symbolic thought is a by-product of this fact, and so is language. Both result from the collision of conscious minds in culture. The evolutionary origins of language are tied to the early emergence of knowledge networks, feeling networks, and memory networks, all of which form the cognitive heart of culture[38].

We cannot even use our brains without the help of culture. The whole heuristic exercise, therefore, of conceiving of human cognition without culture is, as Clifford Geertz long ago pointed out, senseless:

> Undirected by culture patterns – organized systems of significant symbols – man's behavior would be virtually ungovernable, a mere chaos of pointless acts and exploding emotions, his experience virtually shapeless. Culture, the accumulated totality of such patterns, is not just an ornament of human existence but – the principal basis of its specificity – an essential condition for it[39].

There is, in other words, «no such thing as a human nature independent of culture»[40]. We were in fact culture-mongerers long before we appeared as a species.

---

[36] VITTORIO GALLESE, *A neuroscientific grasp of concepts: From control to representation*, «Philosophical Transactions of the Royal Society of London» 358, 2003, pp. 1231-1240; VITTORIO GALLESE, GEORGE LAKOFF, *The brain's concepts: The role of the sensory-motor system in conceptual knowledge*, *Cognitive Neuropsychology* 22, 2005, pp. 455-479.
[37] MARK JOHNSON, *The Meaning of the Body: Aesthetics of Human Understanding*, Chicago & London, The University of Chicago Press, 2007, p. 175.
[38] MERLIN DONALD, *A Mind So Rare: The Evolution of Human Consciousness*, New York & London, W. W. Norton & Company, 2001, p. 253.
[39] CLIFFORD GEERTZ, *The impact of the concept of culture on the concept of man*, [1966], reprinted in CLIFFORD GEERTZ, *The Interpretation of Cultures: Selected Essays*, 33-54. New York, Basic Books, Inc., 1973, p. 46.
[40] *Ibi*, p. 49.

We need an expanded view of what cognition is all about from the brain and body to mind and culture. As I have noted earlier:

During the past decade, a paradigm based on the biological metaphor perceives human consciousness as situated in a web of neurobiological processes, cultural symbols and social mechanisms. Here, culture is indispensable to the construction of mind, the ultimate cause of which is a mixture of genetic and epigenetic factors[41].

The close evolutionary interdependence between cognition and culture has been overwhelmingly argued by various scholars[42]. One can rightfully argue, as Jesper Sørensen has done, that many of the so-called cognitive constraints are oftentimes cultural constraints[43].
So, what do scholars of religion have to do? Based on the central role that culture plays in our cognition, we need to analyze in more detail the myriad techniques that every culture and religion uses as cognitive governance systems. As I wrote elsewhere[44]:

Cognitive governance systems are used to gain access to individual and collective minds and influence the way they see the world and each other. Learning how to attune oneself to these systems is the basic bread and butter of socialization. The latter involves specific techniques to interlink the infant's attentional system with

[41] ARMIN W. GEERTZ, *From apes to devils and angels: Comparing scenarios on the evolution of religion*, in *The Evolution of Religion: Studies, Theories, & Critiques*, edited by Joseph Bulbulia, Richard Sosis, Erica Harris, Russell Genet, Cheryl Genet and Karen Wyman, Santa Margarita, Collins Foundation Press, 2008, pp. 43-49: p. 43.
[42] See for instance EVA JABLONKA, MARION J. LAMB, *Evolution in Four Dimensions: Genetic, Epigenetic, Behavioral, and Symbolic Variation in the History of Life*, Cambridge & London, The MIT Press, 2005; reprint, 2006; SUSAN OYAMA, *Evolution's Eye: A Systems View of the Biology-Culture Divide*, Durham & London, Duke University Press, 2000; PETER J. RICHERSON, ROBERT BOYD, *Not by Genes Alone: How Culture Transformed Human Evolution*, Chicago & London, The University of Chicago Press, 2005; reprint, 2006; KIM STERELNY, *Thought in a Hostile World: The Evolution of Human Cognition*. Oxford & Malden, Blackwell Publishing, 2003; MICHAEL TOMASELLO, *The Cultural Origins of Human Cognition*, Cambridge & London, Harvard University Press, 1999; reprint, 2000; Mary J. WEST-EBERHARD *Developmental Plasticity and Evolution*, Oxford, Oxford University Press, 2003.
[43] SØRENSEN, *Religion, evolution*.
[44] ARMIN W. GEERTZ, *Brain, body and culture: A biocultural theory of religion*, «Method and Theory in the Study of Religion» 2010 (in press).

those of others[45]. These techniques are universal and involve a range of facial, bodily, sonic and linguistic manipulations meant to entice the child into the intricate web of the cultural scaffolding system. The point is not to download the system – no one can do this – rather to gain competence in using the cultural matrix. This learning process is transmitted through pedagogy, generation after generation, which gives the child the ability to maneuver the labyrinths of cultural meaning. As Donald argues, any nuance of gaze, gesture, tone of voice or facial expression is pregnant with meaning[46]. Thus, scholars of religion should pay attention to the earliest socialization techniques, including styles of nursing[47], touch, gaze and so on. These psychological techniques stimulate basic human abilities such as moral sensibility[48], social intelligence[49], mindsight[50] and filling the "information gap" [51].

Furthermore, we must reevaluate the enormous amount of narratives that we have collected during the past 170 years. We need to redirect

[45] DONALD, *A Mind So Rare*, p. 255.
[46] *Ibi*, p. 256.
[47] RELINDIS DZEAYE YOVSI, *Ethnotheories About Breastfeeding and Mother-Infant Interaction: The Case of Sedentary Nso Farmers and Nomadic Fulani Pastorals with Their Infants 3-6 Months of Age in Mbven Sub Division of the Northwest Province of Cameroon*, Münster, Hamburg & London, LIT Verlag, 2003; SARAH BLAFFER HRYDY, *Mothers and Others: The Evolutionary Origins of Mutual Understanding*, Cambridge & London, The Belknap Press of Harvard University Press, 2009.
[48] *Moral Psychology*. Volume 1: *The Evolution of Morality: Adaptations and Innateness*. Volume 2. *The Cognitive Science of Morality: Intuition and Diversity. Volume 3. The Neuroscience of Morality: Emotion, Brain Disorders, and Development*, edited by Walter Sinnott-Armstrong, Cambridge & London, The MIT Press, 2008.
[49] SARAH-JAYNE BLAKEMORE, UTA FRITH, *The Learning Brain: Lessons for Education*, Oxford, Malden, Victoria, Blackwell Publishing, 2005; RAMSEY M. RAAFAT, NICK CHATER, CHRIS FRITH, *Herding in humans*, «TRENDS in Cognitive Sciences» XIII, 2009, 10, pp. 420-428; KAI VOGELEY, ANDREAS ROEPSTORFF, *Contextualising culture and social cognition*, «TRENDS in Cognitive Sciences» XIII, 2009, 12, pp. 511-516.
[50] HELEN L. GALLAGHER, F. HAPPÉ, N. BRUNSWICK, P. C. FLETCHER, U. FRITH & C. D. FRITH, *Reading the mind in cartoons and stories: An fMRI study of 'theory of mind' in verbal and nonverbal tasks*, «Neuropsychologia» 38, 2000, pp. 11-21; HELEN L. GALLAGHER, CHRISTOPHER D. FRITH, *Functional imaging of "theory of mind"*, «TRENDS in Cognitive Sciences» VII, 2003, 2, pp. 77-83; NICHOLAS HUMPHREY, *The Inner Eye*, London, Faber and Faber Ltd., 1986; reprint, Oxford, Oxford University Press, 2002, p. 94.
[51] GEERTZ, *The impact of the concept of culture*, p. 50.

our analyses towards social psychological themes and processes, i.e. how do narratives construct identities, whether in terms of gender, ethnicity or nationality. These same construction activities are also used to determine the identities of minorities, foreigners and peripheral categories of people. Narratives are essential in transforming virtual, religious worlds into human, social realities[52]. It is essential, I believe, that we systematically rethink our narrative sources[53]. Narratives define the world models that directly or indirectly govern us all[54]. These models are not inherent, they are inherited. They might not be rational, but they are assumed to be so. They might not even be

[52] DONALD, *A Mind So Rare*, pp. 295ff.; Roepstorff et al. 2009.

[53] See the coming volume on *Religious Narrative, Cognition and Culture: Image and Word in the Mind of Narrative*, edited by Armin W. Geertz, Jeppe Sinding Jensen, London, Equinox Publishing, 2010 (in press). See also *Making Sense: The Child's Construction of the World*, edited by Jerome Bruner, Helen Haste, London & New York, Methuen & Co. Ltd., 1987; LOUIS J. COZOLINO, *The Neuroscience of Psychotherapy: Building and Rebuilding the Human Brain*. New York & London, W. W. Norton & Company, 2002; DEREK EDWARDS, *Discourse and Cognition*, London, SAGE Publications Ltd, 1997; *Narrative Theory and the Cognitive Sciences*, edited by David Herman, Stanford, CSLI Publications, Center for the Study of Language and Information, 2003; PATRICK COLM HOGAN, *The Mind and Its Stories: Narrative Universals and Human Emotion*, Cambridge, Cambridge University Press, 2003; RUKMINI BHAYA NAIR, *Narrative Gravity: Conversation, Cognition, Culture*, Oxford & New Delhi, Oxford University Press, 2002; *The Remembering Self: Construction and Accuracy in the Self-Narrative*, edited by Ulric Neisser, Robyn Fivush, Cambridge, Cambridge University Press, 1994; *The Conceptual Self in Context: Culture, Experience, Self-Understanding*, edited by Ulric Neisser, David A. Jopling, Cambridge, Cambridge University Press, 1997; ELINOR OCHS, LISA CAPPS, *Narrating the self*, «Annual Review of Anthropology» 25, 1996, pp. 19-43; ELINOR OCHS, LISA CAPPS, *Living Narrative: Creating Lives in Everyday Storytelling*, Cambridge & London, Harvard University Press, 2001; JAMES L. PEACOCK, DOROTHY C. HOLLAND, *The narrated self: Life stories in process*, «Ethos. Journal of the Society for Psychological Anthropology» XXI, 1993, 4, pp. 367-383; *Imagining the Impossible: Magical, Scientific, and Religious Thinking in Children*, edited by Karl S. Rosengren, Carl N. Johson, Paul L. Harris, Cambridge, Cambridge University Press, 2000; *Narrative Psychology: The Storied Nature of Human Conduct*, edited by Theodore Sarbin, New York, Westport & London, Praeger Publishers, 1986; DANIEL SIEGEL, *The Developing Mind: How Relationships and the Brain Interact to Shape Who We Are*, New York & London, The Guilford Press, 1999; ID., *Toward an interpersonal neurobiology of the developing mind: Attachment relationships, "mindsight," and neural integration*, «Infant Mental Health Journal» XXII, 2001, 1-2, pp. 67-94.

[54] DONALD, *A Mind So Rare*, pp. 324ff.

cohesive, but even that is glossed over as we try to get on in the world. Like our brains, so our cultures are busy map-makers, working industriously to merge map with territory[55].

In order to produce, supplement, obtain and react towards this vast matrix of emotional and semantic networks, our cognition involves a great deal of activity outside the brain. Thus cognition is situated in these networks and social relations. It is distributed through the networks and extends itself into those networks. Recent work on cognition emphasizes these characteristics[56]. Prominent names in this line of research, known as "situated cognition", are Edwin Hutchins, Andy Clark and Mark Rowlands[57]. Perhaps more interesting for historians of religions is the concept of "material anchoring," prominent in cognitive archaeology. This research argues that material objects and symbols serve as cognitive anchors for the mind thus allowing minds to do things they would not ordinarily be able to do[58].

Scholar of religion Matthew Day picked up on this theme, arguing that «the broad spectrum of rituals, music, relics, scriptures, statues and buildings typically associated with religious traditions may be more

[55] FRITH, *Making Up the Mind*; CLIFFORD GEERTZ, *Ethos, world view and the analysis of sacred symbols* [1957], reprinted in ID., *The Interpretation of Cultures: Selected Essays*, New York, Basic Books, Inc., 1973, pp. 126-141; ID., *Religion as a cultural system* [1966], reprinted in ID., *The Interpretation of Cultures*, pp. 87-125.

[56] PHILIP ROBBINS, MURAT AYDEDE, *A short primer on situated cognition*, in *The Cambridge Handbook of Situated Cognition*, edited by Philip Robbins, Murat Aydede, Cambridge et al., Cambridge University Press, 2009, pp. 3-10.

[57] EDWIN HUTCHINS, *Cognition in the Wild*, Cambridge & London, The MIT Press, 1995; reprint, 2000; ANDY CLARK, *Being There: Putting Brain, Body, and World Together Again*, Cambridge & London, A Bradford Book, The MIT Press, 1997; Id., *Supersizing the Mind: Embodiment, Action, and Cognitive Extension*, Philosophy of Mind, Oxford & New York, Oxford University Press, 2008; MARK ROWLANDS, *Externalism: Putting Mind and World Back Together Again*. Montreal, Kingston, Ithaca, McGill-Queen's University Press, 2003.

[58] LAMBROS MALAFOURIS, *The brain-artefact interface (BAI): A challenge for archaeology and cultural neuroscience*, «Social Cognitive and Affective Neuroscience» 2010, pp. 1-10 (in press); STEVEN MITHEN, *The Prehistory of the Mind: A Search for the Origins of Art, Religion and Science*, London, Thames and Hudson Ltd., 1996; reprint, London, Phoenix, 1998; *Cognition and Material Culture: The Archaeology of Symbolic Storage*, edited by Colin Renfrew, Chris Scarre, Cambridge, McDonald Institute for Archaeological Research, 1998; MARGARET WILSON, *The re-tooled mind: How culture re-engineers cognition*, «Social Cognitive and Affective Neuroscience» 2010, pp. 1-8 (in press).

than quaint ethnographic window dressing»[59]. Furthermore:

> Rather than thin cultural wrap arounds that decorate *real* cognitive processes going on underneath, these elements could represent central components of the relevant machinery of religious thought. By introducing tangible features of the world that can be physically manipulated and tracked in real-time, for example, the cognitive scaffolding that religious material culture affords seems tailor-made for allowing people to exchange the intricate "off-line" problems that arise from dealing with invisible, counter-intuitive supernatural agents for the kinds of "on-line" cognitive tasks they are naturally good at doing[60].

We surround ourselves, he notes in reference to Donald Norman, with «things that make us smart»[61] and that help us break the boundaries of our brains. Day contends that religious rituals can be mind tools «that functionally extend the bare Darwinian brain's aptitudes»[62].
Thus the cognitive science of religion needs to deal with research on materiality, location, spatial organization, social organization and systems theories.

Tools for bodies and brains

Such tools and gadgets that extend and materialize our minds and help us do things smarter and more efficiently are, however, a two-way street. Merlin Donald, for one, is concerned with the fact that our enormously powerful external memory banks have an equal and potentially destructive impact back into our minds: «...the increasing number of potential foci, the higher turnover rates of information, and the speed with which we can shift time perspectives or change our locus in the memory stream have driven our conscious capacity to the wall»[63]. He calls it our «cerebral boxing match» with culture. At any rate, the patterns that emerge in culture «dominate the cognitive uni-

[59] MATTHEW DAY, *Religion, off-line cognition and the extended mind*, «Journal of Cognition and Culture» IV, 2004, 1, pp. 101-121: p. 101.
[60] *Ibidem*, p. 101.
[61] DONALD NORMAN, *Things that Make Us Smart*, Reading, Addison-Wesley, 1993; DAY, *Religion, off-line cognition*, p. 112.
[62] DAY, *Religion, off-line cognition*, p. 114.
[63] DONALD, *A Mind So Rare*, p. 259.

verse that defines what "reality" is»[64].
If it was all just a question of mental procedures and innate cognitive constraints, then culture would not be such a powerful factor. The former stance ignores the fact that culture isn't just *is*, it's *used*. Culture is acquired through socialization techniques, imitation and deliberate pedagogy. And, as already mentioned, the techniques for learning how to master cultural matrices can also be used the other way around. There are many ways that culture with or without active human agents, can invade our minds. Active cultural agents have a tendency to enforce cognitive management styles. It's as if it comes with the package. Anything that has the potential of entrainment, attunement, conformity and control will be used by people in power for various purposes. That is perhaps why politicians and priests – much like illusion artists – must by definition be adept illusionists. They tap into our natural moral sensibilities and belief in authority. Their main instrument is sincerity. When people discover they have been duped, they become extremely, almost viscerally, angry because they have been invaded and abused, thus reminding them how truly vulnerable they are. It makes sense, however, that for a collective system to work, individuals need to voluntarily mesh and intricate themselves into it. Donald calls it «deep enculturation».
This vulnerability is not just mental or emotional. It is very physical, and that is because we more or less wear our bodies and brains on our shirtsleeves. Forgive the pun, but our nervous system is constructed as one whole system connecting outside and inside in one entity. The system is also connected to our limbic system and executive control system, thus allowing for the physical manipulation of body posture or various forms of suggestion in order to influence our emotional and mental states[65]. As I noted elsewhere:

It is through these nervous systems that the ideas, values, and desires

[64] *Ibi*, p. 287.
[65] LAWRENCE W. BARSALOU, PAULA M. NIEDENTHAL, ARON K. BARBEY, JENNIFER A. RUPPERT, *Social embodiment*, «The Psychology of Learning and Motivation. Advances in Research and Theory» 43, 2003, pp. 43-92; PAULA M. NIEDENTHAL, LAWRENCE W. BARSALOU, PIOTR WINKIELMAN, SILVIA KRAUTH-GRUBER, FRANCOIS RIC, *Embodiment in attitudes, social perception, and emotion*, «Personality and Social Psychology Review» 9, 2005, 3, pp. 184-211.

of other people can gain access to our brains and minds. Rituals are the most dramatic ways to manipulate bodily and mental states and thus change and direct our minds. Techniques that often are used to manipulate bodies are:

- song, dance, clapping, swaying, jumping in place, hopping
- diverse body postures such as bowing, strutting, prostration
- other techniques such as torture and violence in initiation rituals, vision rituals, and mysticism rituals
- use of specific techniques for changing mental states such as smoking, alcohol, drugs, fasting, extreme movement or immobility, and photic and sonic drive techniques

Music and rhythmic movement are extremely seductive methods[66]. They are clearly connected to early interactions between mother and child, involving stereotypy (simplification, formalization), repetition, exaggeration and elaboration, traits which in more expanded form are central to religious rituals[67]. Thus ceremonies involving such techniques tug deeply at the existential foundations of each and every individual and have the ability to arouse, shape and form emotions and mental states.[68]

Lawrence Barsalou and his team in an article entitled *Embodiment in religious knowledge*[69] argue that there are three main ways in which embodiment is at play: in religious visions, beliefs and rituals:

> In religious visions, the process of simulation offers a natural account of how these experiences are produced. In religious beliefs, knowledge about the body and the environment are typically central in religious frameworks, and are likely to affect the

[66] *Music and Manipulation: On the Social Uses and Social Control of Music*, edited by Steven Brown, Ulrik Volgsten, New York, Berghahn Books, 2006.

[67] ELLEN DISSANAYAKE, *Homo Aestheticus*: *Where Art Comes From and Why*, New York, The Free Press, 1992; reprint, Seattle & London, University of Washington Press, 1999; EAD., *Art and Intimacy: How the Arts Began*, Seattle & London, University of Washington Press, 2000.

[68] GEERTZ, *Brain, body and culture*, in press.

[69] LAWRENCE W. BARSALOU, ARON K. BARBEY, W. KYLE SIMMONS, AVA SANTOS, *Embodiment in religious knowledge*, in «Journal of Cognition and Culture» V, 2005, 1/2, pp. 14-57.

perception of daily experience. In religious rituals, embodiments appear central to conveying religious ideas metaphorically and to establishing them in memory[70].

Thus we need to go back to our sources and look more closely at how religions «use the body in conveying knowledge, implementing values and producing or changing mental and emotional states»[71]. We should pay more attention in general to body functions and the senses[72]. Bodies are not just metaphors in religious texts, they are real, biological entities governed by sensibilities, values, norms and institutions. The way religions treat the body are highly indicative of the systems of thought and traditional assumptions behind such behavior. Such behavior is most often so tacit that scholars must pay special attention to the literature or contrive to conduct interviews in order to gain indirect access to those tacit assumptions.
Bodies are also manipulated in healing systems. Healing systems reflect the religious worldviews in which they are anchored. The rituals that are applied during healing sessions are often a combination of a variety of techniques such as narrative therapy, suggestion and physical modulation or manipulation of the body. A key factor in such techniques is placebo[73]. Physician Ted J. Kaptchuk even argues that alternative healing rituals are "placebo dramas", i.e. placebo is generated through performative efficacy which relies on «the power of belief, imagination, symbols, meaning, expectation, persuasion, and self-relationship»[74].

---

[70] *Ibi*, p. 14.
[71] GEERTZ, *Brain, body and culture*, in press.
[72] DIANE ACKERMAN, *A Natural History of the Senses*, New York, Random House, Inc., 1990; reprint, New York, Vintage Books Edition, 1995; *The Book of Touch*, edited by Constance Classen, Oxford, Berg 2005.
[73] JEROME D. FRANK, *Persuasion and Healing: A Comparative Study of Psychotherapy. Revised Edition*. 2nd ed. Schocken Paperbacks on Psychology. Baltimore, The Johns Hopkins University Press, 1961; revised 1974, reprint, New York, Schocken Books, 1977.
[74] TED J. KAPTCHUK, *The placebo effect in alternative medicine: Can the performance of a healing ritual have clinical significance?*, «Annals of Internal Medicine» CXXXVI, 2002, 11, pp. 817-825: pp. 817-818. See also THOMAS J. CSORDAS, *Body/Meaning/Healing*. Basingstoke & New York, Palgrave Macmillan, 2002; DYLAN EVANS, *Placebo: Mind Over Matter in Modern Medicine*, London, HarperCollins Publishers, 2003; PREDRAG PETROVIC, THOMAS DIETRICH, PETER FRANSSON, JESPER ANDERSSON, KATRINA CARLSSON, MARTIN INGVAR, *Placebo in emo-*

The brain, body and mind in religion

Thus we come full round to Uffe Schjødt's call for a scientifically rigorous neurobiology of religion[75]. Not everyone can do this, but the results of such studies should prove to be important for our understanding of religions as lived, embodied, situated and distributed systems of knowledge, emotions and memory. But it requires a critical reading of the methods and paradigms of such studies.

A good example of how neurobiology can help us is the work of neurologist Quinton Deeley. In his article *The Religious Brain: Turning Ideas into Convictions*, he argues that there are two major strategies that religious rituals employ which, in drawing inspiration from Clifford Geertz's famous definition of religion, «convey conceptions of the world and invest them with a heightened sense of reality and emotion»[76]. These two are a sensory route and a semantic route. I will come back to these routes in a moment. His point of departure is that we act on the basis of our assumptions, beliefs and convictions. These convictions have enormous power, but where do they come from? Surely, powerful convictions are not solely the result of conceptualization? There are two systems at play when convictions and salience are present: the limbic system and the monoaminergic systems. The limbic system is the essential foundation of our emotional and social competencies[77]. It is in close contact with the prefrontal cortex (the area of executive functioning) and uses the endocrine system (hormones) as well as the sympathetic ("fight or flight") and parasympathetic ("rest and digest") nervous systems. The limbic system is modu-

---

tional processing: Induced expectations of anxiety relief activate a generalized modulatory network, «Neuron» 46, 2005, pp. 957-69; PREDRAG PETROVIC, EIJA KALSO, KARL MAGNUS PETERSSON, MARTIN INGVAR, *Placebo and opioid analgesia: Imaging a shared neuronal network*, «Science» 295, 2002, pp. 1737-1740; PHILIPP STERZER, CHRIS FRITH & PREDRAG PETROVIC, *Believing is seeing: Expectations alter visual awareness*, «Current Biology» 18, 2008, 16, R697-R698.

[75] UFFE SCHJØDT, *The Neural Substrates of Prayer: Toward an Experimental Neuroscience of Religion*. PhD dissertation, Aarhus, Faculty of Theology, University of Aarhus, 2009.

[76] PETER Q. DEELEY, *The religious brain: Turning ideas into convictions*, «Anthropology & Medicine» XI, 2004, 3, pp. 245-267: p. 245.

[77] ANTONIO R. DAMASIO, *The Feeling of What Happens: Body, Emotion and the Making of Consciousness*, London, Heinemann, 2000.

lated by the monoaminergic systems (such as neurotransmittors which are endogenous chemicals) of the brainstem. There can be no doubt that these are active during different religious experiences.
Quinton Deeley argues that these systems strengthen our convictions and persuade us that they are "uniquely realistic":

> Religious rituals, especially imagistic rituals,[78] employ two major strategies to convey conceptions of the world and invest them with a heightened sense of reality and emotion: (1) a "sensory" route evokes salient thought and experience by orchestrating multiple reinforcing social-emotional signals and other stimuli, engaging attention, emotion, and arousal; (2) a "semantic" route uses enigmatic verbal and nonverbal symbols to engage an analogical/right hemispheric processing strategy to make sense of what is authoritatively presented as real but incompletely understood. Both routes are hypothesized to activate the mesolimbic dopamine system amongst other components of cognitive-affective processing, so that the "moods and motivations" evoked by the ritual performance seem "uniquely realistic". These social, cognitive, and neural processes constitute ways in which religious ideas are turned into convictions[79].

Deeley draws on the "saliency hypothesis" whereby dopamine «mediates the conversion of the neural representation of an external stimulus from a neutral and cold bit of information into an attractive or aversive entity»[80]. Shitij Kapur, Deeley's colleague, shows that especially the mesolimbic dopamine system is a critical component «in the "attribution of salience", a process whereby events and thoughts come to grab attention, drive action, and influence goal-directed behavior because of their association with reward or punishment»[81].
Neurologist V.S. Ramachandran describes in his book *Phantoms in the Brain* how some patients with temporal lobe epilepsy suffer from an overstimulation of "saliency pathways". These pathways recognize the emotional significance of events because they are connected to the

[78] Here he is referring to Harvey Whitehouse's modes of religiosity, i.e. the imagistic and the doctrinal.
[79] DEELEY, *The religious brain*, p. 245.
[80] SHITIJ KAPUR, *Psychosis as a state of aberrant salience: A framework linking biology, phenomenology, and pharmacology in schizophrenia*, «American Journal of Psychiatry» CLX, 2003, 1, pp. 13-23: p. 14.
[81] *Ibidem*, p. 14.

limbic system. Patients who suffer from such conditions experience things that resonate with many religious traditions around the world:

> *Every* object and event – not just salient ones – would become imbued with deep significance, so that the patient would see "the universe in a grain of sand" and "hold infinity in the palm of his hand". He would float on an ocean of religious ecstasy, carried by a universal tide to the shores of Nirvana[82].

Ramachandran asks whether this is the origin of religious experience. It may not be the origin, but surely is at play in religious convictions and experiences! Whatever the connection may be, I am convinced that ecstatic ritual behavior somehow stimulates the saliency pathways which leads to an overproduction of meaning which in turn are supported and encouraged in many societies, even to the point of acknowledging the power and authority of those who experience vivid saliency (shamans, spirit possession priests, oracles, etc.). I am in good company on this with, among others, neurologist Fred Previc who argues that the origins of religion are linked to «an expansion of dopaminergic systems in humans»[83].

What about history?

This is all well and good, but what about history? History is, after all, what most scholars of religion work with. There is a rapidly growing literature on the origins of religion, cognition and culture[84], but it seems as if the focus of cognitive studies jumps from studies of the cognitive abilities of modern-day American psychology students to

---

[82] V.S. RAMACHANDRAN, SANDRA BLAKESLEE, *Phantoms in the Brain: Human Nature and the Architecture of the Mind*, London, Fourth Estate, 1998, p. 183.

[83] PREVIC, *The role of the extrapersonal brain systems*, p. 500.

[84] See for instance JOSEPH BULBULIA, *The cognitive and evolutionary psychology of religion*, «Biology and Philosophy» 19, 2004, pp. 655-686; *The Biology of Religious Behavior: The Evolutionary Origins of Faith and Religion*, edited by Jay R. Feierman, Santa Barbara, Denver & Oxford, Praeger, 2009; *Origins of Religion, Cognition and Culture*, edited by Armin W. Geertz, London, Equinox Publishing, 2010 (in press); *The Believing Primate: Scientific, Philosophical, and Theological Reflections on the Origin of Religion*, edited by Jeffrey Schloss, Michael J. Murray, Oxford & New York, Oxford University Press, 2009; *Theorizing Religions Past: Archaeology, History, and Cognition*, edited by Harvey Whitehouse, Luther H. Martin, Walnut Creek et al., AltaMira Press, 2004.

speculations, however informed they may be, on the cognition of Australopithecines. Furthermore, interest in the *Homo sapiens* line hardly extends further than the cave paintings of 25,000 years ago. Why aren't there studies about what's in between? There are, of course, a few such studies. The pioneers of the cognitive science of religion have demonstrated what can be done with sources that are typical in the study of religion. Lawson and McCauley applied their ritual competence theory and ritual form hypothesis on well-known examples as wide-ranging as Hindu rituals, the Christian Eucharist and Zulu initiations. Whitehouse based his modes of religiosity hypothesis on a recent millenarian movement among the Pomio Kivung of Papua New Guinea. Pascal Boyer's examples of religious concepts and rituals are taken from modern indigenous tribes in Africa. Stewart Guthrie has applied his insights on Japanese village religiosity and modern American advertisements and media.

There are several scholars now working on historical topics such as Luther H. Martin[85], Istvan Czachesz[86] and Panayotis Pachis[87], but this is still uncharted territory. There are two problems in applying cognitive theory to historical topics. The first is that the cognitive science of religion has, as already mentioned, a methodological proclivity to delete the cultural equation, and it is thus very difficult for cultural scientists to apply those theories. The second is that only a few theories seem to be useful to historical studies. Whitehouse's modes theory has proven to be useful, as a number of publications indicate[88]. Most of the other theories have only been of interest to cognitive scientists of religion who are pursuing psychological experiments.

---

[85] LUTHER H. MARTIN, *History, cognitive science, and the problematic study of folk religions: The case of the Eleusinian Mysteries of Demeter*, «Temenos. Nordic Journal of Comparative Religion» 39-40, 2003-2004, pp. 81-99.

[86] ISTVÁN CZACHESZ, *The promise of the cognitive science of religion for Biblical studies*, «Bulletin of the Council of Societies for the Study of Religion» XXXVII, 2008, 4, pp. 102-105.

[87] Panayotis Pachis, *Imagistic modes of religiosity and the study of the cults of Graeco-Roman world*, in *Imagistic Traditions in the Graeco-roman World: A Cognitive Modeling of History of Religious Research*, edited by Luther H. Martin, Panayotis Pachis, Thessaloniki, Vanias Editions, 2009, pp. 15-34.

[88] *Theorizing Religions Past; Imagistic Traditions in the Graeco-roman World: A Cognitive Modeling of History of Religious Research*, edited by Luther H. Martin, Panayotis Pachis, Thessaloniki: Vanias Editions, 2009.

A collection of studies on historical themes is in press at the moment[89], but what we also need is to develop hypotheses and theories that are both historical and experimental. The recent collection of essays in *Natural Experiments of History*, edited by Jared Diamond and James A. Robinson, may be a possible avenue for historically oriented scholars of religion[90]. Simulation approaches, such as those being conducted by Donald Braxton, are another possible avenue. Braxton argues that despite the weaknesses of computer simulations, they allow us to formulate historical hypotheses that may be tested either by computer simulations or by other means[91]. This exercise is quite valuable for historians of religions because it encourages them to think much more theoretically *and* much more empirically than usual. The exercise requires historians to think more formally about their hypotheses, whether these are implicit or explicit. Stark's interesting attempts at applying sociological theories to early Christianity, weaknesses notwithstanding, should serve as an example of how cognitive theories and hypotheses might be applied to historical topics[92].

A way forward

We need to develop constructive criticisms of results from the cognitive science of religion. We must test their theories, but we must also test our own theories. The study of religion must develop a true comparativism and re-invent a true humanism by building bridges between disciplines.[93] If the academic study of religion won't do these things, others, who are less competent in comparative religion, will.

To cognitive scientists of religion, I have no better comment than that expressed by Mark Johnson:

---

[89] *Past Minds*, edited by Luther H. Martin, Jesper Sørensen, London, Equinox, 2010 (in press).

[90] *Natural Experiments of History*, edited by Jared Diamond, James A. Robinson, Cambridge & London, Harvard University Press, 2010.

[91] DONALD M. BRAXTON, *Beyond sui generis religion: When neither Eliade nor postmodernism suffice*, «Zygon» XLIV, 2009, 2; ID., *Modeling the McCauley-Lawson ritual form hypothesis, in Religious Ritual, Cognition, and Culture*, edited by Armin W. Geertz, Jesper Sørensen. London, Equinox, 2010 (forthcoming).

[92] RODNEY STARK, *The Rise of Christianity: How the Obscure, Marginal, Jesus Movement Became the Dominant Religious Force*, New York: HarperOne, 1997.

[93] EDWARD SLINGERLAND, *What Science Offers the Humanities: Integrating Body and Culture*, Cambridge, Cambridge University Press, 2008.

There are certain popular theories of mind and language that are incompatible with empirical evidence about the brain and cognition. If your favorite theory is at odds with this research, then you ought to be worried, and you ought to be asking whether you need to rethink some of your cherished hypotheses[94].

One example of just such a cherished hypothesis is any theory of language that builds on neural modularity or similar claims about dedicated systems.
What is needed in the cognitive science of religion are more women scholars and more philosophers of science conversant with the cognitive sciences. Furthermore, we need more research on religion and... gender, children, socialization, violence, location, authority, healing, the senses, bodily manipulation, war, liberation, repression, identity and memory. More research on cognition and texts and on cognition and history. More research on embodiment and a critical revisiting of religious experiences. Furthermore we need better theories and creative hypotheses that are more resonant with what we know about human bodies and minds. And we need to deal creatively in developing natural experiments both in the wild and in the laboratory.
Can the comparative study of religion meet these challenges? I believe it can, mainly because of European sensitivity to cultural traditions. All we need to do is acknowledge that cognition is a combination of embrainment, embodiment and enculturation.

[94] JOHNSON, *The Meaning of the Body*, p. 156.

Περίληψη

Το άρθρο αυτό βασίζεται στις εργασίες που διεξάγονται σε μία ερευνητική ομάδα της οποίας είμαι επικεφαλής και ονομάζεται Θρησκεία, Νόηση και Πολιτισμός (Religion, Cognition and Culture – RCC). Αρχικά είχε σχεδιαστεί ως ένα ιδιαίτερο πεδίο έρευνας από το Τμήμα Θεολογίας στο Πανεπιστήμιο και εν συνεχεία ενσωματώθηκε ως μία ανεξάρτητη ερευνητική μονάδα στο Τμήμα Μελέτης της Θρησκείας.[95] Σε μία πρόσφατη ανακοίνωση του RCC, υποστηρίζουμε ότι οι άνθρωποι είναι συγχρόνως βιολογικά και πολιτισμικά όντα. Σε ολόκληρη την ιστορία των ανθρωποειδών, η ανθρώπινη βιολογία και οι πολιτισμός δεν έχουν ποτέ διαχωριστεί. Κάθε νεογέννητο βρέφος είναι συγχρόνως ημιτελώς και μοναδικά εξοπλισμένο, βιολογικά και γνωσιακά οργανωμένο να ανθήσει σε κοινωνικο-πολιτισμικά περιβάλλοντα που ποτέ τα γονίδιά του δεν θα μπορούσαν να προβλέψουν. Επομένως απαιτείται μία προσέγγιση του νου δεν περιορίζεται στον εγκέφαλο. Έτσι πρέπει να προσεγγίζουμε τη νόηση ως ενσωματωμένη και διανεμημένη. Πρέπει να αναλύουμε τη θρησκεία μελετώντας τη λειτουργική οργάνωση του ανθρώπινου εγκεφάλου, την αλληλεπίδρασή του με τους κοινωνικούς και πολιτισμικούς κόσμους στους οποίους ζει και τους οποίους τροποποιεί, και τους αναπτυξιακούς περιορισμούς και την ευελιξία του. Το RCC είναι προφανώς ένας ευρωπαϊκός θεσμός. Διαφέρει ως προς την προσέγγισή του στη νόηση από κάποια, λίγα σε αριθμό, ιδρύματα στις Ηνωμένες Πολιτείες, την Αγγλία και τη Βόρεια Ιρλανδία που ασχολούνται με τη νόηση και τη θρησκεία. Ωστόσο, το RCC είναι παρόμοιο ως προς την προσέγγισή του με άλλες ευρωπαϊκές πρωτοβουλίες όπως την ομάδα νόησης στο Χρόνινγκεν και το ερευνητικό πρόγραμμα στο Ελσίνκι. Επομένως θα μπορούσαμε να ισχυριστούμε ότι η προγραμματική επιμονή μας στους αιτιακούς δεσμούς ανάμεσα στη θρησκεία, τη νόηση και τον πολιτισμό είναι μία παραδόξως ευρωπαϊκή προσέγγιση. Στη συνέχεια, θα εξηγήσω πώς η γνωσιακή επιστήμη της θρησκείας μπορεί να γίνει περισσότερο σχετική με τη συγκριτική μελέτη της θρησκείας και με την πιο πρόσφατη γνωσιακή επιστήμη ακολουθώντας την ευρωπαϊκή προσέγγιση.

[95] Το παρόν άρθρο αποτελεί εκτενώς επεξεργασμένη εκδοχή της εναρκτήριας διάλεξής μου που παρουσιάστηκε στο συνέδριο της Ευρωπαϊκής Ένωσης για τη Μελέτη των Θρησκειών (EASR) στη Μεσσίνα το 2009 με τίτλο «Religion, Cognition and Culture: A European Idea?»