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Mapping the cerebral subject in contemporary culture

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Abstract
The research reported here aims at mapping the "cerebral subject" in contemporary society. The term "cerebral subject" refers to an anthropological figure that embodies the belief that human beings are essentially reducible to their brains. Our focus is on the discourses, images and practices that might globally be designated as "neuroculture." From public policy to the arts, from the neurosciences to theology, humans are often treated as reducible to their brains. The new discipline of neuroethics is eminently symptomatic of such a situation; other examples can be drawn from science fiction in writing and film; from practices such as "neurobics" or cerebral cryopreservation; from neurophilosophy and the neurosciences; from debates about brain life and brain death; from practices of intensive care, organ transplantation, and neurological enhancement and prosthetics; from the emerging fields of neuroesthetics, neurotheology, neuroeconomics, neuroeducation, neuropsychoanalysis and others. This research in progress traces the diversity of neurocultures, and places them in a larger context characterized by the emergence of somatic "bioidentities" that replace psychological and internalistic notions of personhood. It does so by examining not only discourses and representations, but also concrete social practices, such as those that take shape in the politically powerful "neurodiversity" movement, or in vigorously commercialized "neuroascetic" disciplines of the self.

Keywords
Brainhood, cerebral subject, biosociality, brain imagery, neuroculture

The term "cerebral subject" refers to an anthropological figure that embodies the idea that the human being is essentially reducible to his or her brain; our goal is to sketch its history and map its multifarious presence in contemporary culture. This project is being carried out in the framework of a cooperation agreement between the authors' two institutions. Since 2005, the exchange of Brazilian and German scholars who work on related topics concerning the impact of the neurosciences in contemporary culture has been supported by a grant to the authors from the German Academic Exchange Service /Capes; an international conference, "Neurosciences and Contemporary Society," took place in Rio de Janeiro in August 2006 (www.brainhood.net).

The goal of the research in progress is to sketch the history of the cerebral subject, to examine at least some of its main intellectual and practical effects, and

to map at least some of its main social and cultural embodiments in the realm of both ideas and practices. Our focus is on the constellation of discourses, images and practices that makes up that region of the cultural universe of industrialized nations sometimes designated as "neuroculture." Let us consider the following: "Person P is identical to person P* if and only if A and B have one and the same functional brain" (FERRET, 1993, p.79). What this formula says, is that to have the same brain is to be the same person, and that the brain is the only part of the body we need in order to be ourselves. The "person" thus defined would be a cerebral subject, and would be characterized by the property of "brainhood," i.e. the property or quality of being, rather than simply having, a brain (VIDAL, 2005, forthcoming).

The cerebral subject is obviously not the only anthropological figure with roots in the life sciences. Immunology has been defined as the science of self-nonself discrimination, and genetics has inspired various forms of organic essentialism. The genetic self might be the cerebral subject's strongest competitor; and yet, as a Swiss bio-ethicist has pointed out,

> "if one compares "genome-based" and "brain-based" explanations of self and behavior, it turns out that neural aspects of human nature are more directly relevant. Many philosophical and ethical questions traditionally raised about genetics and genomics acquire more relevance and urgency when re-examined in the context of neuroscience." (MAURON, 2003, p.204)

Some reasons for this are empirical (e.g. genomes are replicable, brains aren't), others more philosophical (e.g. since genetic influences on personality and behavior must be mediated by the brain, brain determinism cannot be refuted by pointing to other causal factors, such as the environment). Thus, in spite of the increasing convergence of genetics and the neurosciences, issues of self and personhood remain primarily related to brain structure and functioning.

After more than a decade of rapid growth of discussion about the social impact of the neurosciences, terms like "brainhood" and "cerebral subject" may help connect social processes, cultural representations, scientific developments, and developments in medicine, philosophy, education, the media and elsewhere, that historians, philosophers, anthropologists and sociologists have been studying from their own perspectives. Neuroculture, as a conglomerate of cultures of the "neuro," is widely distributed. From public policy to the arts, from the neurosciences to theology, humans are often treated as reducible to their brains. The rapidly rising domain of neuroethics seeks to explore these matters; and examples can be drawn not only from science fiction in writing and film, or from various practices, such as "neurobics" or cerebral cryopreservation, but also from neurophilosophy and the neurosciences; from debates about brain life and brain death; from practices of intensive care, organ transplantation, and neurological enhancement and prosthetics; from the emerging fields of neuroesthetics, neurotheology, neuroeconomics, neuroeducation, neuropsychoanalysis and others.

As a first step, we think in terms of three approaches: historical, cultural, and social. Such a division is temporary, since things constantly intermingle. For example, reacting to the idea that a transplantation of X's brain into Y's body would actually be a full body transplant (with Y the donor and X the receiver), a leading neuroscientist commented: "This simple fact makes it clear that you are your brain" (GAZZANIGA, 2005, p.31). Such a statement must be examined from different angles. How did we reach the point when somebody can say, "You are your brain," and make his claim sound self-evident? History provides many clues. But considering that human beings *are* their brains also has significant social consequences, in the fields of law and medicine for example. And neither law nor medicine, nor the neurosciences themselves, are independent from representations, values, hopes and practices rooted outside their professional boundaries. Since the nineteenth century, the brain has functioned both as a mediator and as a projection surface; by now, it has become a social actor. That is why, in our research, we approach the neurosciences as being embedded in the social fabric, rather than as merely having "social implications" or an "impact" on society.

The brain has a privileged place in the depiction of individuality and subjectivity in corporeal terms. Beliefs, desires and behaviors are often described in a cerebral or neurochemical vocabulary, thus expressing the notion of a "neurochemical self" (ROSE, 2003). At the same time we started talking about the "cerebral subject," sociologist Alain EHRENBERG (2004) independently used the term in connection with the "strong program" of the neurosciences (knowing the self is knowing the brain). In this context, the cerebral subject constitutes a major biosocial anthropological figure, a central form of the wider mutation in personhood that has been called "somatic individuality" (NOVAS & ROSE, 2000).

Our research emphasizes several specific topics: (1) The history of the cerebral subject, including the emergence of the brain as an organ of the self in the sciences of the mind and the body, as well as the transformations in philosophical notions about personal identity. (2) The elaboration of the cerebral subject in popular culture, including literature and film, as well as scientific popularization and the mass-media presentation of neuroscientific findings. (3) The rise since the 1990s of various "neuro" disciplines (we already mentioned neuroesthetics, neurotheology, neuroeconomics, neuroeducation and neuropsychoanalysis) that conquer ground previously occupied by the human sciences. In this context, (4) neuroethics (as both the ethics of neuroscience and the neuroscience of ethics) occupies a special intellectual, political and institutional space, and so do (5) the commercial practices associated with brainhood, such as neuromarketing and the "neurobics" business. We also deal with: (6) Debates (about, for example, brain death, enhancement techniques and grafting of neural tissue) that directly concern the handling of human beings as cerebral subjects. (7) How brainhood takes form in clinical settings (especially in connection with

autism, depression, Attention Deficit and Hyperactivity Disorder, schizophrenia and Post Traumatic Stress Disorder), and (8) how neurosociabilites develop around the claims of "neurodiversity" and the identification of patients' groups with a certain brain condition (ORTEGA, forthcoming).

Likewise, we are interested in forms of resistance to brainhood. Some of them have come from the cultural history of the brain sciences (HAGNER, 2006). Philosophical criticism may be found, from the phenomenological point of view, in the work of Paul RICOEUR (1990), and from a viewpoint closer to the Anglo-American analytical tradition, in Kathleen WILKES's (1988) argument for a philosophy of personal identity "without thought-experiments." The late Francisco Varela spoke of "neurophenomenology" as a means to reintegrate into the neurosciences embodiment and the first-person experience. We shall explore critical engagement with brainhood not only among psychologists, philosophers, anthropologists or psychoanalysts, but also in the work of artists who use medical technologies or materials to probe the meaning of personhood and the limits of self-knowledge.

In all the areas we are studying, functional neuroimages appear as icons, and as actors in the processes of shaping subjectivity (DUMIT, 2004). Although often taken as immediately legible, such images result from technical decisions concerning how digital data is to be represented. What does that imply for the materialization of invisible psychological qualities and experiences? What is the relation of the image to the object of knowledge pursued in the laboratory? In a sense, the question "What do we see when we look at a brain scan?" epitomizes the problem we are investigating.

The most popular method – and the one that drives the growth of the "neuro" fields mentioned above – is functional magnetic resonance imaging (fMRI. Like research on consciousness and the brain localization of the self, the fields that thrive on the availability of fMRI are mostly about material foundations and "neural correlates." Neurotheology, for example, aims at investigating the neurological bases of spiritual and mystical experience. Similarly, neuroesthetics, neuropsychoanalysis, neuroeducation, neuroeconomics or social neuroscience look for the neurobiological "underpinnings" of the processes studied and described by esthetics, psychoanalysis, education, economics or social psychology. Neuroethics occupies in this universe a special position. Broadly defined, it deals with the ethical, social and legal challenges that arise in neuroscience; most of it, however, concerns the ethics and uses of fMRI studies in the humanities and social sciences. Moreover, as we shall try to show, neuroethics, as it is currently practiced, tends to give support to the idea of the human being as a cerebral subject, and is thereby closely allied to the practices and discourses of neuroascesis, which apparently stand at the opposite extreme of the "neuro" spectrum (ORTEGA & VIDAL, forthcoming).

Functional neuroimages seem to provide visual diagnoses, and tell us why we are the way we are. They have become pictures of the self at the expense of public awareness that they result from complex processing of computer data, and could look totally different. Brain imaging specialists are in this respect ambivalent (JOYCE, 2005): they criticize popular presentations of fMRI, and treat images as merely visualized numbers; yet, like most public commentary about scans, they also identify the images with transparency, objectivity and progress, and personify the technique in ways that blur the distinctions between machine and image, and attribute to MRI itself the capacity to produce and express knowledge directly.

On the positive side, brain images help de-stigmatize mental illnesses by graphically confirming that they are conditions of the brain. Patients understand themselves not as "having," say, depression, but as being a particular kind of person, a depressed person, by virtue of having (or rather being) a certain brain type. "Neurodiversity" becomes a value that "neurotypicals" must respect. Neurodiversity justifies forms of being in the world that are embodied in practices, and fit into the context of the concepts of the modern anthropologist Paul Rabinow, in connection with the socio-cultural and political consequences of genetics and the Human Genome Project, called "biosociality." We use this term to designate a form of apolitical sociality formed by groups of private interests that are no longer organized according to grouping criteria such as race, class, social status or political orientation, as was the case in the 19th-century biopolitics analyzed by Michel Foucault. Biosocial groups are rather structured according to criteria of health, bodily performances, specific illnesses or longevity, and they function according to criteria of merit and recognition that express values embodied in hygienic rules, activity schedules, and ideal models of the self based on physical regimes.

A medical-physical vocabulary (about biological invariants, cholesterol rates, muscular tonus, physical performance, aerobic capacity, and other measures) popularizes and enacts quasi-moral norms, and provides criteria for evaluating each individual. At the same time, social, religious, sport and sexual activities are re-conceptualized as health practices. Psychological and internalistic notions of personhood are substituted by somatic "bioidentities." These are constituted through a "bioascesis," or practices and disciplines of the self that reproduce the rules of biosociality at the subjective level. Among those practices, "neuroascesis," or a cerebral self-discipline aimed at maximizing brain performance, has gained considerable momentum, and defines one of the many worlds of the *neuro* universe. This particular culture is socially significant in that it contributes to the formation of neurosocialities and neuroidentities.

There exists a growing market for neuroascesis products, which include among others, cerebral self-help manuals, brain-fitness software and computer programs that turn into real "brain gyms," and vitamins and all kind of dietary support purported to enhance brain performance. Proclaiming oneself as a cerebral subject

is turning into a biosocial criterion of social grouping, as can be seen in support groups for bearers of different diseases and neurodegenerative disorders and their families; in the already mentioned neurodiversity movement; in the competition and training groups that come together to test brain performances in "brain clubs," "World Memory Championships," or the "Mind-sport Olympiads;" in neurocommunities such as *Braingle* (www.braingle.com), aimed at a teenage public, and including discussion forums, talk boxes for private conversations and a live chat service.

A significant fact is the extent to which the related neurobics literature reproduces earlier commonplace self-help literature, even going back to the nineteenth century, with an updated scientific vocabulary. This is typical of the "neuro" field we examine: neuroethics, for example, repeatedly asserts that the neurosciences are bringing about a revolution in our views of the human beings, and will radically alter traditional questions concerning free will or moral responsibility. Yet, their analyses of those traditional questions run counter to their revolutionary rhetoric.

The ideology of the cerebral subject involves a fundamental paradox. The brain appears as the material organ par excellence, as the only part of our physical bodies that is really worth exercising in order to improve ourselves. As in neurobics, the brain is treated as a muscle; brain-building is the royal road to shaping the person. At the same time, philosophical fictions, science-fiction literature, and films often locate immortality in the continuance of one's brain. Immortality is insured through successive transplantations of your brain into a younger body. Thus, contrary to one of the main concerns of industrialized societies, the imagined brain never ages; it has symbolically incorporated the qualities of the soul, the immaterial substance par excellence. Together with its numerous roots and incarnations, this paradox stands at the center of the research we have reported here.

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Born and raised in Buenos Aires, Argentina, Fernando Vidal received a B.A. from Harvard University, graduate degress in psychology and the history and philosophy of science from the Universities of Geneva and Paris I, and a *Habilitation* from the Ecole des Hautes Etudes en Sciences Sociales, Paris. He is presently Senior Research Scholar at the Max Planck Institute for the History of Science in Berlin. He has worked on various topics in the history of the human sciences, including the early development of psychology as a discipline, sexuality in the 18th century, psychoanalysis and psychiatry in the early twentieth century, the progressive education movement in the interwar years, the early-modern history of the imagination, and miracles as epistemic things. His books include *Piaget Before Piaget* (1994), a biography of the Swiss psychologist Jean Piaget which investigates the interplay and contexts of his religious, political, philosophical, and scientific concerns until the 1930s, as well as *Les Sciences de l'âme, XVI^e^-XVIII^e^ siècle* (2006), a study of the transformation of the "sciences of the soul" between the invention of the word "psychology" and the emergence of "empirical psychology" in the Enlightenment. He has also edited a collection of Jean Starobinski's writings on the history of the body (*Las razones del cuerpo*, 1999), *The Moral Authority of Nature* (with Lorraine Daston, 2004), and, most recently, a special issue of *Science in Context* (with Bernhard Kleeberg, September 2007) entitled *Believing Nature, Knowing God*. His current work focuses on the cultural history of the "cerebral subject."

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