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Book Author(s): Fernando Vidal and Francisco Ortega

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How did the idea that humans are essentially their brains become thinkable? Why should it be considered a “creed” and not the articulation or corollary of a proven “scientific fact”? How is it expressed in notions and practices across a wide variety of domains in many contemporary societies? Does it really fashion people’s lives, and if yes, how and to what extent? These are the basic questions this book seeks to explore.

It is no news that since the “Decade of the Brain” of the 1990s, the brain has become a major focus of attention. Starting in the following decade, that focus became itself the object of considerable interest to scholars in human sciences such as anthropology, disability studies, history, and sociology, who have delved into aspects of what has been variously called the “neural turn,” the “neuro-turn,” and the “neuroscientific turn.” While these labels sometimes refer to academic developments in the human sciences themselves (for example, the appearance of neuroanthropology, neuroeducation, neurolaw, neurotheology, and others), they apply to a more widespread phenomenon.

Neuroscientific research has attracted lavish funding in North America and Europe; the World Health Organization considers neurological conditions one of the greatest threats to public health; and while it still speaks of “mental health,” successive directors of the U.S. National Institute of Mental Health, the world’s largest scientific organization in the area, have insisted that mental disorders must be understood and treated as brain disorders. Beyond research and the clinic, the brain and neuroscientific information form the core of a vast universe that ranges from crassly commercial enterprises to lofty metaphysical speculations. Within that universe, the undisciplined multiplication and the often comical abuse of the prefix *neuro-* are like the small signals that confirm the existence of a large-scale phenomenon.¹

Over the years, in the course of presenting, individually or together, the topics that make up the present book, we have been complimented for being critical of the “neural turn” in matters of personhood, culture, and society—almost as much as we have been accused of being “against” the neurosciences or neuroimaging methods, of refusing fruitful interactions between the brain sciences and the human sciences, or of exaggerating the impact of the *neuro* in contemporary society. (“*Neuro*” is not the reification of anything but only a concise way of designating the universe discussed in this book.) Since we risk being again in the same position, let us, to begin with, try to be clear.

Beyond considerations about the intrinsic value of knowledge, how could anyone be “against” sciences and methods that demonstrate that a large number of persons diagnosed as being in a vegetative state may have minimal consciousness or against investigations that may contribute to the understanding and treatment of dementias or crucially strengthen what we know about the dramatic developmental effects of deprivation? We are, if anything, “for” them. But we could certainly be described as being “against” some of the most extravagant claims and some of the most injudicious applications of the *neuro*. We cannot be convinced that beauty is definable as a quality in objects that correlates with activity in the medial orbitofrontal cortex—or that such a definition can serve as the basis for assessing individual artworks or explaining aesthetic experience. Nor do we think that neurobiological approaches, whether inspired by conviction or by opportunism, are always appropriate or even relevant to account for complex human phenomena. Basically, we do not take the *neuro* as something that “comes

naturally,” and we question most interpretations of the commonplace according to which *The mind is what the brain does*.

Such a stance grew firmer in the course of our research, and it informs our account. Since the early 2000s there has been a considerable amount of work done by historians and social scientists from various disciplines on the rise, forms, and functioning of the *neuro* in contemporary culture. We have profited from it, but we do not deal with the history and sociology of the neurosciences, unravel the dynamics of “biopolitical governmentality” as such, or disentangle the many ways in which the *neuro* may represent technocratic ideals or accord “with neoliberal precepts of choice, flexibility, self-care and personal responsibility” (Cromby and Williams 2011, 217; see also Cooter 2014, Maasen and Sutter 2007, Pitts-Taylor 2010). Rather, we examine the roots of the notion that, as persons, humans are in principle reducible to their brains as well as some of that notion’s main conceptual and practical forms, developments, and implications (related terms, such as *neurocultures* and *cerebral subject*, will appear and be explained later). Although we do not explicitly explore the potential biopolitical repercussions of the neurosciences or the “life-science boom” in political theory (Meloni 2012), *Being Brains* is “political” in the general sense that it deals, selectively but consistently, with processes that touch on people’s lives, the constitution of subjectivities, and the distribution of power within societies. Its overarching political dimension concerns ways in which the *neuro* becomes involved in the “government of the living,” informs interventions in human lives, and participates in processes of subjectivation (Rose and Abi-Rached 2014). This dimension cuts across all the contexts we examine here and encompasses other local and global processes involving interactions of knowledge, interests, and values, such as the rise of the global mental health movement or the impact of pharmaceutical companies in shaping healthcare.

We are here concerned with the history and forms of a modern creed. Yet how “neutrally” can they be explored? To reconstruct the genealogy of the late twentieth-century neural turns and to delineate the topography of the *neuro* not only opens the way to assessing them critically: it also makes criticism an integral part of the project. In using “genealogy” we do not intend to be systematic about it but merely to signal our affinity to Michel Foucault’s enterprise and in particular to his idea of genealogy as a “history of the present”—as a mode of analysis and narrative that begins with a

diagnosis and questions about a current situation and assumes that “writing a history *of* the present means writing a history *in* the present; self-consciously writing in a field of power relations and political struggle” (Roth 1981, 43; see also Garland 2014).

The medical historian Roger Cooter (2014, 147) rightly notes that “the neuro-turn stymies the will to, and possibility for, its own critique”; some authors explore the varieties of “neuroskepticism” from an epistemological point of view (Forest 2014), polemicize against the “neuro-enthusiasm” of contemporary “neuro-prophets” (Hasler 2013) or combat the “dictatorship of the brain” and the oppression of “cerebral fundamentalism” (Strasser 2014, 49). We have benefited from their work, trying to deal with the challenge of neutrality not in the distraught mode of the detractors of *neuromythology*, *neurotrash*, *neuromania*, or *neuromadness* but by uncovering implicit assumptions and the internal logic of the *neuro* and its applications.² In some cases, we show that the emperor has no clothes. Yet that is only one aspect, and probably not the most significant one, of our project. As Jan de Vos and Ed Pluth (2016, 2) aptly remark, just rejecting the claim that “we are our brains” overlooks “the crucial fact that we have already become brain-people, tremendously conscious that we are our brains.” Rather than negating it, we take the ideology of the *neuro* as a social, cultural, and psychological reality.

We study different forms of brain-based subjectivation critically, but, contrary to the reproach that “we exaggerate,” we remain aware that the neurocentric view of the human, while powerful and pervasive, is neither hegemonic nor monolithic and serves various, sometimes incompatible interests and values. We argue that this view is *ultimately not* dependent on scientific knowledge about the brain. In spite of that, and even if the *neuro* lacks the radically transformative impact often attributed to it, by the early twenty-first century it had taken shape in an immense range of products and initiatives, from amateurish self-help booklets to the one-billion-euro Human Brain Project and the three-billion-dollar BRAIN Initiative, both launched in 2013.³

A central feature of such range is that, instead of composing a hierarchy where the “scientific” merely inspires the “popular,” it configures a sort of endless ribbon where forms of knowledge and practice circulate in all directions, sometimes colliding but generally driving one another and feed-

ing into one another.⁴ In the early twenty-first century, those processes belong in a framework where, as the projects just mentioned illustrate, neuroscience has turned into “big science” and increasingly into a science of “big data” (see, for example, Cunningham and Yu 2014) that has even opened itself to crowdsourcing and citizen participation.⁵

Moreover, as a clinical and laboratory discipline, neuroscience has become largely international.⁶ Dominated by the United States between World War II and the 1990s, it expanded significantly in Europe, Australia, Canada, Brazil, and some Asian countries (Japan, and then China at the turn of the twenty-first century). This growth, which can be quantified via publications in international peer-reviewed journals (Abi-Rached, Rose, and Mogoutov 2010), can also be observed, though it has not been formally substantiated, at the level of neuroscientific studies of “human science” topics, science popularization, and straightforwardly commercial applications (such as the self-help industry), all of which can be found not only in the major players but also in countries as distant and different as Argentina and Taiwan, with many others in between.

This very range—conceptual, practical, methodological, geographical—demands that we specify, in a jargon-free manner, what we mean when we talk of “neurocultures” or refer somewhat globally to the *neuro*. Obviously, single-cell recordings in animals are not the same thing as neuroimaging studies of cultural difference or religious experience, and a “neurobics” institute does not represent the same kind of entity as an international conglomerate of major neuroscientific labs. They nevertheless share (at least in many of their practices, as well as in their self-presentations and promotional campaigns) the conviction that we are essentially our brains. This boosts the extreme porosity of their boundaries. The *neuro* encompasses scientific and nonscientific cultures permeated but not exclusively ruled by such a conviction, and this persuasion can in turn be expressed in many modes, from the proselytizing to the tentative. In the continent of neurocultures, local areas may be scrutinized, but it is not possible to demarcate in general the lands of the “good guys” who do the basic science and the territories of the “bad” ones who unduly market hype and hope. They all stand together within one system and are jointly liable for the consequences of their claims. There is in this respect no difference between the “brain gym” quack and the adviser to the BRAIN Initiative who claims that when humanity fully

understands its brain, it will understand itself from within, and that such development will revolutionize culture and constitute “a new humanism.”⁷

In 2011, we sketched a “neurocultural spectrum” and referred to the world of neurocultures as an “expanding universe” (Vidal and Ortega 2011). The expansion has kept going on, and that means that, although we have ranged widely, we have not spent the same amount of time in each place and have been necessarily selective in our travelogue. We focus on the view of the human as cerebral subject as it developed and became embodied in attempts to guide human behavior and explain its most complex expressions. We examine its different forms, fully aware that no one form is voiced or held by every individual involved, and that, as Nikolas Rose and Joelle Abi-Rached (2013, 223) point out, the *neuro* has not displaced our self-understanding as people with interior mental worlds that are causally related to our behaviors.

Again in connection with the ostensibly global nature of the *neuro*, it must be acknowledged that, as a set of concretely enacted concepts and beliefs, it does not exist everywhere, even if it has continuously expanded and its worldwide penetration can be expected to go on. But where it does exist, it displays, in contrast to the *psy*, remarkable homogeneity. Psychoanalysis provides a patent example. As it became international, it diversified and developed markedly idiosyncratic forms within different national contexts. Beyond a few common fundamental concepts, which can also take on some local color, psychoanalysis is not the same in Paris, New York, or Buenos Aires, and not even inside those cities (Damousi and Plotkin 2009). The *neuro* is. Not only does it globally share, as other sciences, a set of assumptions, concepts, and methods, but it everywhere derives epistemic and social value from its allegedly validating and making more real or objectively known phenomena that are well documented within the human sciences. Yet it seems clear that neuroimaging is not necessary for us to realize that meditation may have beneficial effects (we will come back to this), to learn that magical events in *Harry Potter* may surprise and give pleasure (Hsu et al. 2015), or to explain the “Pepsi paradox.”⁸ That is why numerous articles and lectures claiming to provide neuroscientific explanations for psychological phenomena do no more than present behavioral data juxtaposed with scant neuroscientific information—or merely accompany the description of *psy* processes with the assertion that they involve the brain. Clever marketing, but deceptive packaging.

Territories Traveled

Being Brains prospects distinct territories in which the *neuro* and “cerebralization” processes can be surveyed, selected so as to ensure diversity and breadth. The first chapter provides a historical, long-term view. It proposes to trace the distant roots of the cerebral subject (a notion we discuss in some detail) to the late seventeenth century and particularly to debates about the seat of the soul, the corpuscularian theory of matter, and John Locke’s philosophy of personal identity. In the wake of Locke, who defined personal identity as a continuity of consciousness and memory, eighteenth-century authors began to assert that the brain is the only part of the body we need in order to be ourselves. In the nineteenth century, this form of deterministic essentialism contributed to motivate research into brain structure and function, and it in turn confirmed the brain-personhood nexus. Since then, from phrenology to functional neuroimaging, neuroscientific knowledge and representations have constituted a powerful support for prescriptive outlooks on the individual and society. A fundamental ideological continuity underlies technical, conceptual, and empirical advances in neuroscientific research and practices.

“Neuroascensis,” as we call the business that sells programs of cerebral self-discipline, is a case in point. On the one hand, it appeals to the brain and neuroscience as bases for its self-help recipes to enhance memory and reasoning; fight depression, anxiety, and compulsions; improve sexual performance; achieve happiness; and even establish a direct contact with God. On the other hand, underneath the *neuro* surface lie beliefs and even concrete instructions that can be traced to nineteenth-century hygiene manuals. The vocabulary of fitness is transposed from the body to the brain, and traditional self-help themes and recommendations are given a neuroscientific luster.

The second chapter considers the emergence, since the 1990s, of fields whose names often combine the suffix *neuro* with the name of one of the human and social sciences, from anthropology and art history to education, law, and theology. These “disciplines of the *neuro*” (minor but vocal subspecialties within their parent fields) reframe the human sciences and their corresponding subjects on the basis of knowledge about the brain. Driven

by the availability of imaging technologies, they look for neural correlates of behaviors and mental processes. Originally concerned mainly with the study of sensory and motor functions, brain imaging studies since the early 1990s have increasingly dealt with topics of potential ethical, legal, and social implications, such as attitudes, cooperation and competition, violence, political preference, or religious experience. Commercial enterprises like neuromarketing have developed concomitantly. The media, both popular and specialized, has given much room to these new fields, thus underlining how rapidly neuroscientific knowledge spreads beyond the confines of brain research proper into different areas of life and culture as a whole. We provide an overview of these fields as well as a more focused examination of neuroaesthetics and the “neurodisciplines” of culture. Though recurrently presented as a way of solving centuries-old riddles and offering solutions to supposed crises in the humanities, these new fields apply methods that are intrinsically inadequate to the objects and phenomena they claim to address.

The third chapter explores one area of major social impact: the cerebralization of psychological distress. The psychopharmacological revolution took place in the 1950s. Later on, the nosological biologization of mental disorders received a crucial impetus when *DSM III* (1980), the third edition of the American Psychiatric Association’s influential *Diagnostic and Statistical Manual of Mental Disorders*, opened the way to redescribing in neurological terms disorders such as schizophrenia, autism, and depression. Behaviors previously considered merely awkward, such as shyness, or seen as having a major social component, like alcoholism or obesity, have become predominantly neurological conditions. We provide an overview of such a situation as well as a more detailed examination of the cerebralization of depression, which is a particularly complex cultural and biopolitical phenomenon. We shall also explore the consequences of the cerebralizing trend for the constitution of “forms of living.” While biological psychiatry has been criticized as dehumanizing, it has also helped free patients and families from blame and stigma. Insofar as a problem resides within the brain, the individual bears no guilt; though organic, the disorder is externalized relatively to the person’s identity. This absolutism inspired and sustained a “neurodiversity” movement led by high-functioning autistics who believe that their condition is not a disease to be treated and, if possible, cured but rather a human specificity to be respected like other forms of difference (sexual, racial, and

so forth). There is, however, no consensus on the cerebralization of psychological distress, which is fought out in a field characterized by strong tensions and conflicting interests.

The final chapter moves to forms of the *neuro* in popular culture. Film and literature have in many ways rehearsed the connection between personal identity, having a body and being a brain, and they have been major sites for elaborating and questioning the human as cerebral subject. Numerous works can be identified as “brain movies” and “brain novels”: most Frankenstein films since the 1940s; B-series productions from the late 1950s to the early 1970s, in which brains themselves are protagonists; science fiction novels of the same period, which stage and exploit brain transplants or brains in vats. While we shall give room to these particular literary and filmic subgenres, our focus will be on later novels and films. We shall privilege works that explore existential, interpersonal, psychological, ethical, and scientific aspects of the relations between having a brain and being a person less through the basic structure of their plots or the direct display of physical brains than through stylistic and formal features. In both areas we demonstrate that even the productions that start out treating humans as cerebral subjects end up contesting brain reductionism and that such constitutive ambivalence is emblematic of the status of the cerebral subject in the modern and contemporary world.

A Threefold Argument

A threefold argument is refracted throughout this book and aims at providing an integrated perspective. Diverse disciplines and discourses presuppose that the mind or self are to different degrees reducible to brain states; they assume that the mind, together with the products of human action, is what the brain does and that we are essentially (though not exclusively) our brains. We first argue that such identification neither resulted from neuroscientific breakthroughs nor depends on knowledge about the brain but was made possible by early modern scientific and philosophical developments that affected notions of personhood and personal identity. We then observe that the corollary of the first historical and historiographical point is that while later neuroscientific research bolstered the “cerebralization” of personhood,

it did not, despite many claims, substantiate it either conceptually or empirically. Rather, such cerebralization is an underlying presupposition that dictates the way research is done and its results are interpreted, generally well beyond anything legitimately allowed by the experimental settings and the data generated. Finally, despite its powerful rhetoric, the cerebralization of personhood has nothing necessary or inevitable about it, yet it acts as a connective tissue supporting and linking diverse materials, just as the same bedrock lies at variable depths and with different densities beneath disparate landscapes.

A trajectory through such landscapes poses many challenges at different levels. Two of the most uncomfortable ones concern the danger of being outdated and the possibility of maintaining distance. On the one hand, the corpus of relevant materials, not only from experimental laboratories and neuroimaging facilities but also from the media, the Internet, and the most varied businesses and human science departments, increases constantly and at an unmatched rate. The timing of publication is such that any book or article analyzing as topical a subject as the *neuro* risks being partly outdated by the time it becomes publicly available. This is not merely a trivial practical problem: it potentially questions one's analyses and conclusions. Won't the rapid "advancement of science" quickly invalidate them? Surely this is what many *neuro* advocates would claim, but in doing so, they would be mainly reiterating the usual strategy of justifying the present by appealing to imagined, hoped-for futures. On the other hand, while even the most bizarre ideologies of the past are interesting objects to be examined and contextualized, the present touches us differently and prompts us to get involved. When understood on its own terms, nothing (or almost nothing) in the past seems absurd, vacuous, or nonsensical. But anachronism is not a risk for judgments about the present, and many neurocultural matters call for them. Such is the predicament of working on contemporary phenomena that have real effects on people's lives, and (as indicated above when we mentioned Foucault) we have considered it more productive to embrace it than to deny it.

In short, *Being Brains* approaches the *neuro* as a "cultural resource."⁹ This it does in two ways. On the one hand, the *neuro* functions as an entry point into the history, conditions, and forms of modernity and thus as a resource for us as scholars. The price to be paid as a consequence is that

those who critically work on the universe we here characterize as that of neurocultures inevitably contribute to its workings and perhaps even to its perpetuation. On the other hand, and more importantly, the *neuro* is a cultural resource in the same sense that evolutionism might be. As the details and specifics of neuroscientific results are blurred and transformed when they diffuse outside the labs, they provide vividly descriptive and interpretive pictures of the world as well as road maps and calls to act in the present and the future, including for those involved in neuroscientific research. The *neuro* thus ends up serving a multiplicity of interests in contexts ruled more by economic or political considerations (in the broadest sense of those terms) than by the ideals of logic, verifiability, and objectivity that—at least in an abstract view of science—govern the production of knowledge. But of course the two realms are not totally distinct: economics and politics permeate science as much as a certain sense of logic and objectivity may be pursued outside science. The vast realm of “the personal” matters crucially in the constitution, authority, and status of late modern technoscientific knowledge (Shapin 2008).

We have all too often heard that the brain is the most complex object in the universe and that the most important thing we have learned concerning that organ is how little we know about it. Beyond serving professional interests well, the combination of the Delphic “Know thyself” and the Socratic “I only know that I know nothing” has convinced many that the world is not totally disenchanted and compelled them to join the chorus. Ultimately, and beyond the narrower issues we deal with here, the ideology that tells us that we are essentially our brains claims to provide answers to a number of perennial questions about human nature and human destiny. We may object to those answers but don’t need normatively to decide whether they are right or wrong, for the main thing about them is that, as William James said of God in the conclusion to *The Varieties of Religious Experience*, they are real since they produce real effects.

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