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### **The Death and the Resurrection of (Psy)critique: The Case of Neuroeducation**

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**In: Foundations of Science, Online First, 17 Oct 2014**

**<http://link.springer.com/article/10.1007/s10699-014-9369-8>**

**To refer to or to cite this work, please use the citation to the published version:**

**De Vos, J. (2011). The Death and the Resurrection of (Psy)critique: The Case of Neuroeducation. *Foundations of Science*, Online First, 17 Oct 2014, doi 10.1007/s10699-014-9369-8**

# The Death and the Resurrection of (Psy)critique: The Case of Neuroeducation

## *Abstract*

A rapidly emerging hegemonic neuro-culture and a booming neural subjectivity signal the entry point for an inquiry into the status of the signifier *neuro* as a universal *passe-partout*. The wager of this paper is that the various (mis)appropriations of the neurosciences in the media and in academia itself point to something essential, if not structural, in connection with both the discipline of the neurosciences and the current socio-cultural and ideological climate. Starting from the case of neuroeducation (the application of neuroscience within education), the genealogy of the neurological turn is linked to the history of psychology and its inextricable bond with processes of psychologisation. If the neurological turn risks not merely neglecting the dimension of critique, but also obviating its possibility, then revivifying a psy-critique (understanding the academified modern subject as grounded in the scientific *point of view from nowhere*) might be necessary in order to understand today's neural subjectivity and its place within current biopolitics.

## 1. Introduction

It has been argued that the neurosciences, in the space of only a few decades, have spawned both a hegemonic neuro-culture and a neural subjectivity—i.e. Fernando Vidal's "cerebral subject" (Ortega and Vidal 2007) and Nikolas Rose's "neurochemical self" (Rose 2006). How we experience ourselves and the world is said to increasingly hinge on neurological rather than "psychological and internalistic notions" (Ortega and Vidal 2007, p. 255). As such, it is evident that within numerous scientific and para-scientific fields the prefix *neuro* has become ubiquitous. In this way, then, approaches such as neuroeducation, neuropolitics or neuroaesthetics are prone to have an important bearing on our contemporary life-world and shape significantly our self and world experience.

But something strange happens when the signifier neuro becomes the universal passe-partout: that is, it becomes a voracious black hole. To put it bluntly, one could argue that in mainstream and/or popularized neuro-approaches, not only is there not much neuroscience to be found, but neither is there much of the host discipline to be found either. Neuropsychology, neuroeducation, neuropolitics, neuroaesthetics, for example, often have very little to do with actual neurology, nor psychology, education, politics or aesthetics for that matter. Just consider (popular) neuropsychological issues such as ADHD, dyslexia, autism and such like. On the one hand, the firm assertion of their neurological causes is only superfluously fleshed out—as (vast) research on these disorders has failed to live up to the promise to deliver the final and categorical proof of their organicity (for an excellent critique see Timimi et al. 2010; Timimi and Radcliffe 2005). While, on the other hand, these tropes jeopardize the very conception of the psyche or the psychological. Hyperbolically speaking, the average psychologist working with the DSM categories as a rule rejects the psychological dimension.<sup>1</sup>

One could consider such instances as marginal trends in academia or mere popularized aberrations. But what if those blunt and misplaced expropriations of the neurosciences actually tell us something essential about the neurosciences themselves, and, in particular, about the allying of the neuro with the sciences? That is, the eagerness with which academia and the broader public has embraced the neurosciences is perhaps not only symptomatic of specific academic praxes and the wider socio-cultural constellation generally, but also has profound relevance for our attempts to understand the functioning of the neurosciences themselves today. Hence, the challenge is to connect the conditions of (im)possibility of neurology (as the latter is inevitably embedded in cultural, political and popular contexts) to those of the other sciences (as these seek to ground their own terms of (im)possibility in the supposed firm and neutral body of knowledge of the neurosciences).

The urgency of these questions stems from the fact that the neurological turn risks not only neglecting the dimension of critique, but also obviating its possibility. For if the signifier “neuro” does in fact explain it all, then there is no longer an outside, a beyond, from where a critical approach could begin. Or might it be, as some argue, that the critical potential has to come from within the specific realm of the neurological itself? In any case, given the hegemonic neuro-culture and neuro-subjectivity, all this is bound to affect current modes of understanding ourselves and the world.

In order to approach these broad and far-reaching issues, it might prove expedient to perform a closer examination of both neuropsychology and neuroeducation. As the neurological turn is said to replace psychological subjectivity with so called “brainhood” (Ortega and Vidal 2007) the neurosciences are also increasingly invoked as the final au-

thoritative source concerning how we should conceive of education and parenting. Looking at praxes in schools and in parenting counseling one could go as far as to speak, not just of a neurological turn, but in terms of a neuro-tsunami, hailing everybody, both pupil and parent, into the neuro-discourse. What, one might ask, will be the effects if soon all generations become immersed in the hegemonic neuro-discourse? A closer examination of neuroeducation will allow us to resist the temptation of putting forward the disclaimer that processes of neurologisation are only secondary ones and, thus, that the neurosciences themselves can be rescued from all this. In fact, from taking a critical look at neurological research on education the properly radical conclusion to be drawn is that neurology and neurologisation are two sides of the same coin and hence are co-originary.

## 2. The Vantage Point: Old Psy-critique?

In search for a ground on which to base a critique of the neurological turn, Foucault's question "(w)hat is critique?" immediately brings us to the core of the matter. Following Kant, Foucault argues that post-Enlightenment humanity was going to put its own reason to use, without subjecting itself to any authority:

... now it is precisely at this moment that the critique is necessary, since its role is that of defining the conditions under which the use of reason is legitimate in order to determine what can be known, what must be done, and what may be hoped (Foucault 1984, p. 38).

Arguably, the figures of authority and sovereignty are replaced here by the impersonal agency of the discourse of Science and expert-knowledge. That is, if emancipation from authority is to pass through reason and knowledge, the modern sciences are bound to play a pivotal role. One might argue that in modernity critique is inevitably scholarly. Ideological or political critique, for example, thus necessarily assumes the form of an academic discussion. Just consider how when policies and politicians are criticized, scientific arguments suddenly pop-up which draw upon economical sciences, climatology, demography, etcetera, alongside, where possible, the use of the neuro-prefix (e.g. neuro-economy, neuro-ethics...). For example, Rush Holt (scientist and politician) writes in *Nature* that "(p)oliticians should think like scientists," (Holt 2012). Herman Van Rompuy (president of the European Council) urges political leaders to take onboard positive psychology as it "concerns itself in a scientific way with the quality of life" (my italics, Van Rompuy 2012). And Matthew Taylor, Labour party activist and government adviser un-

der Tony Blair, contends that insights from neurological research can offer a more solid base “than previous attempts to move beyond left and right” (Taylor 2009).

It is also crucial, however, to observe how the so-called layman increasingly adopts academic discourses in his or her exertion of reason and critique. Think about how rapidly and recurrently the expression “did you know that according to science...” is evoked in discussions about food, health, relations, etcetera. Or, to turn to the field of education, consider how parents when criticizing the school often do so in scientific terms: the teacher either does not possess the requisite pedagogical skills, or lacks knowledge about learning disabilities and developmental psychology.

In this way it seems that we are all critical—if not, all too critical. Let me cite the example of a remarkable campaign in Belgium which seeks to demystify the taboo around mental illness. “Te Gek”<sup>2</sup> is a kind of critical psychiatry movement that wants to mobilize a broad audience around the message that being mad is not wholly different from being normal. Concerts, theatre performances, exhibitions, a television documentary series, carnivalesque marches, etcetera., all convey the message that being mental is OK, if not, in fact, hip. However, we should ask from where, from within which discursive position in other words, such an utterance is being made. In the television documentary series, for example, it was blatantly clear that everyone –the experts, the policy makers, the critics, the teachers, the parents, and the mad themselves—share one and the same discourse: an academic discourse on mental illness. A young man with ADHD, fluently enumerating the DSM-criteria, told of how, for example, he had been able to turn his ADHD into a positive asset. A girl with ASD (autism spectrum disorder), in turn, said she was happy that her parents, her friends and the people in her school were well acquainted with the disorder and where thus able to help her. Should we not be more than a little suspicious, however, of how everyone has seemingly adopted the academic psy-talk so as to define mental problems as something common and natural? A telling observation, in this regard, is one which occurred in a ludic march of the Te Gek-campaign (with celebrities and other people chanting and dancing), when the television cameras suddenly turned to a lone figure dancing awkwardly and isolated from the motley crew. It was a figure of whom one could think: amidst all these beautiful people, this is the only one who really could come from the asylum. This figure, through the uneasiness he provoked, problematised the easy celebrative and carnivalesque critique, starkly demonstrating how the latter can actually result in a levelling out and denying of (psychic) sufferance.

As such, it is clear how this highly-marketed campaign, involving the mobilisation of celebrities and artists and the organization of ludic and artful activities, implies a specific subjective position from where everybody is called upon to “do normal in relation to

mental disturbances”. This position, I want to argue, is analogous to the much critiqued position of the multiculturalist who proclaims his solidarity and defends cultural differences precisely from a universal point allegedly transcending all these contingent differences (see, for example, Žižek 1997). It is from this superior universal and academically informed vantage point that both the multiculturalist and today’s critical psychiatry-activist claim to speak on the behalf of everyone. If the basic message is that taboos have to be demolished and supplanted by a positive and correct image of mental disorders, then everyone is called upon, as such, to join the position of those who ostensibly know better. Hence, by singing, dancing and marching alongside celebrities, everyone partakes in the detached, external meta-point of view, in turn, turning the sublunary world into a screen onto which a particular, academically informed, world-view is projected. It was this carefully constructed imaginary scene which was momentarily problematized by the awkwardly dancing man who thus represented a profound critique of the comfort-zone of the righteous.

However, is this not a reproduction of an old form of psy-critique, that is, criticizing the unacknowledged vantage point into which the psy-sciences used to hail the layman?3 Indeed, psychology never succeeded in solving (or simply taking into account) the paradox of the redoubling of agencies in which its discourse and praxis inevitably results. That is, psychology’s knowledge necessarily takes the form of, “you are wrong about yourself and others”, and this epistemological denouncement leads to an, albeit not always explicitly stated, ontological claim: “that’s what you are”. For example: “you think you are altruistic, but actually you are only looking after your own genes”. Here, the interpellated subject is redoubled: “look, that’s who you are” is answered by “oh, really, is that what I am?” Therefore, if psychology psychologizes the subject, then this means that it puts the subject in a meta-position beyond its own psychology; as a kind of neo-Cartesian cogito it contemplates itself and the world via the discourse of psychology (De Vos 2012). But if the Cogito (offering the modern subject an, arguably, academic vantage point to look upon itself) was first denounced as illusory by the deconstructionist approaches (e.g. Derrida, Deleuze), then the final death blow came at the hands of the neurosciences: brain scans showed that there is nobody at home in the brain (see, for example, Dennett 1991; Metzinger 2003). Hence, with the neurological turn, one could argue that the paradigm of psychologisation, which underpinned the psy-sciences, has come to an end; there is no beyond neurology. However, some caution is warranted here: it still remains to be seen whether the neurosciences really succeeded in doing away with the hidden and denied transcendental vantage point of psychology. On the contrary, it could be that the psychological/psychologised Self is still the spectre haunting the neurosciences. It is this which I will explore in the next section via a closer look at the domain of so-called neuroeducation.

### 3. Neurological Research: Bridging Two Problematic

#### Banks?

The emergent discipline of so-called neuroeducation, significantly, often explicitly distances itself from the hasty, popular or commercialised misappropriations of the neurosciences. Denouncing the so-called naïve “neuromyths”, the argument is invariably that educational practice should be grounded in ‘sound’ neuroscience. It is contended that it is time to carefully assess what is truly useful for education and, moreover, to inform the neurosciences themselves on the specificity of the educational context, in order that relevant research will be generated (see, for example, Patten and Campbell (2011) and other papers in that special issue of *Educational Philosophy and Theory*). Balanced as this stance appears at first glance, the question again concerns whether the neuromyths are merely an unfortunate, academically-unworthy issue urging us to “separat[e] science from speculation” (OECD 2002, p. 69), or whether, alternatively, the neuromyths tell us something structural about the educational and neuroscientific fields, and attempts to merge the two.

To begin with, the neuroeducational approach demonstrates how neurological research attempts to bridge two problematic fields: on one plane, the mind and its psychology; and on the other, the brain and its physiology. Let us refer to a typical neuroeducational systematic review paper, which argues that the neurosciences offer us an understanding “of how the brain learns new information and processes this information throughout life” (Dumontheil and Blakemore 2012, p. 109). According to the authors, Iroise Dumontheil and Sarah-Jayne Blakemore, this is not only significant for specific learning areas such as mathematics and reading skills, but also for the field of social cognition, which, as they note, has been shown to be related to the structural and functional development of the prefrontal cortex. The crucial thing to note, here, is that the principal rationale of such research is to establish a parallel between the mind and the brain, between psychological variables and brain regions. The critique that argues that this amounts to a form of neo-phrenology is often countered by the argument that neuroscientists nowadays envision the activity of neural networks across the whole brain. However, there is little to be gained here: understanding social intelligence, for example, as “a network of neural regions that comprise the ‘social brain’: the orbito-frontal cortex (OFC), superior temporal gyrus (STG) and amygdala” (Baron-Cohen et al. 2008, p. 1891) only repeats the localization stance. But perhaps a more fundamental point might be: what if the two things which one wishes to connect (psychological or subjective variables and brain areas) are in themselves problematic? Let us consider momentarily how Dumontheil and

Blakemore connect social cognition to the medial prefrontal cortex (MPFC); in their review of the literature they argue:

In each of these studies, MPFC activity was greater in the adolescent group than in the adult group during the mentalising task compared to the control task (see Figure 2c and Blakemore 2008). The mentalising tasks ranged from understanding irony, which requires separating the literal from the intended meaning of a comment (Wang et al. 2006), thinking about one's own intentions (Blakemore et al. 2007), thinking about whether character traits describe oneself or another familiar other (Pfeifer et al. 2007, 2009), watching animations in which characters appear to have intentions and emotions (Moriguchi et al. 2007) and thinking about social emotions such as guilt and embarrassment (Burnett et al. 2009). In addition, there is evidence for differential functional connectivity between MPFC and other parts of the mentalising network across age (Burnett and Blakemore 2009) (Dumontheil and Blakemore 2012, p. 104).

While Dumontheil and Blakemore appear to consider “character traits,” “intentions,” “guilt and embarrassment” as neutral parameters from which brain imaging can depart, one should firmly reject that these would be natural or independent variables: rather, they originate in specific theories of the psychology of emotions. Hence, even though these theories might be backed up with psychological research or experiments, it is important to point to the pre-conceptions and theoretical assumptions underlying notions such as “emotions” and “social cognition”. Simply put: what is laid under the scanner is not the psyche, but, rather, psychological theory. Here, it is evident that the neurological turn is certainly not the end of the psychology: the point of departure for neurological research is inevitably still psychology and its assumptions, which serve to provide the initial material and research base for neurology. Hence, also, the tautological risk: psychology is supposed to underpin neurological research while the latter is more and more evoked as the final proof of the scientific validity of the psychological theories themselves. Moreover, one could argue that fMRI, and similar imaging research, necessarily depart from very basic and simple theories of the mind as these have to be easily operationalized in the very basic and straightforward laboratory settings of neurological research. Both the very practical restrictions of fMRI-research (e.g. the test person has to lay down, the head must be immobilized—technical problems which might be one day superseded), and the basic rationale of brain imaging (parallelism and correlationalism) thus demand a very straightforward, simplified theory of the human. In the research cited by Dumontheil and Blakemore, for example, social cognition is made operational via mentalising tasks assessing the understanding of irony, the latter conceived as “separating the literal from the intended meaning of a comment” (Wang et al. 2006). In Wang et al's experiment we have a very practical, binary point of departure: in situation A: the literal and the intended meaning match; in situation B: the literal and the intended meaning differ (Wang et al. 2006). This comes in handy in terms of brain imaging,



because fMRI also hinges on a binary division: regions of the brain light up or do not light up. The critique to make here is, of course, that the rather blunt conception of irony underpinning Wang et al's research (the match or mismatch between literal and intended meaning) rests upon a naïve and outdated theory of language, which presupposes a simple and straightforward relation between signifier and referent. The broad accepted conception of "literal meaning" as always contextual, situational and communicative is bypassed here with a simplistic, dichotomist research outline:

Following the sincere or sarcastic comment, participants were asked to decide whether the speaker really meant what he or she said. Yes/no judgments were indicated by pressing a button with the index or middle finger, respectively (Wang et al. 2006, p. 109).

This ignores that irony precisely relies upon the blurring of such black and white, on and off reasoning. The task given to a fMRI-immobilised test subject could thus be thought of as rather unworldly and artificial, and hence completely irrelevant to understanding a real human being.

However, even at the site of the brain, and the mere physiological (to which the psychological variables are to be matched), things might not be so straightforward. For what is observed in the brain actually depends on a range of presuppositions and postulations: what is a marker for brain activity; what is significant activity; how are brain areas and their boundaries defined... In this respect, brain imaging techniques, for example, have been substantially criticized for being both tentative and coarse (e.g. Álvarez 2011, p. 101), and for relying on unacknowledged decision processes "embedded in local practices of production, reception and communication" (Vidal 2009, p. 27).

The fact that both sites, the psychical and physical, pose manifold problems is exactly why attempts to close the brain-mind gap have become highly problematic. In the Dumontheil and Blakemore paper, for example, the social cognition research allegedly reveals a decreased activation level of the MPFC region in adulthood. This is then ever so tentatively explained as:

One possibility is that the cognitive strategy for mentalising changes between adolescence and adulthood. For example, adults may rely more on previous experiences to interpret social situations than adolescents, who instead might base their judgement on novel computations performed in the MPFC. This possibility may be related to the skill learning hypothesis (Johnson 2011), whereby one region first supports a certain function, but another brain region may take over later in development, and according to which the PFC may be particularly involved during the learning of new abilities. A second possibility is that the functional change with age is due to neuroanatomical changes that occur during this period

(Dumontheil and Blakemore 2012, p. 104, my italics).

Here, the ostensibly precise high technology of the neurosciences seems to end up in high speculation.<sup>4</sup> As the banks are in themselves problematic, the attempt to bridge them lacks any firm ground.

## 4. The Not So Artificial Condition of the Subject in the Scanner

The idea could be that, firstly, we need a more advanced neurology, one capable, for example, of scanning the brains of subjects in their natural environment—perhaps even without them knowing it. And secondly, that we should replace the simplistic on/of psychological models with more nuanced theories of the mind that incorporate deconstructionist and interactionist critiques. However, this optimistic viewpoint would neglect how in today's neuro-research—always at risk of combining naïve objectivism with oversimplified psychological theories—there is a basic aporia to be discerned which we should address as such.

In order to do so, let us once again return to Dumontheil and Blakemore: their basic point of departure is that the human being uses a “theory of mind”:

An understanding of others' mental states plays a critical role in social interaction because it enables us to work out what other people want and what they are about to do next, and to modify our own behaviour accordingly (Frith and Frith 2007) (Dumontheil and Blakemore 2012, p. 101).

This is the so-called Theory of Mind approach (ToM), in which people are seen as quasi-theoricians having the ability to impute mental states (beliefs, thoughts and desires) to other people in order to explain and predict their behaviour (Leudar and Costall 2009). Would this not warrant a careful re-assessment of these positions? For, when a theorist meets a theorist, the situation might be that of the mirror maze in the sense that the expert-theoretician might easily be mistaken in his assessment of the lay-theoretician. Hence, a central issue which risks being overlooked in ToM, is the paradoxical twist of a primordial reflexivity: one has only access to oneself via a theory of mind. To para-

phrase the quote above, one has to come to an understanding of one's own mental state in order to work out what one wants and is about to do next. But even when ToM incorporates the idea that one theorizes about oneself, its problematic underlying assumption remains that the human subject naturally is a theorizing and reflexive being, and that these natural capacities of reason<sup>5</sup> are put to work in an institutionalised and formalised way in science. What is missed here, I would argue, is that the (self)-theorizing subject is a product of the advent of the modern sciences, as these interpellate or hail (to use Louis Althusser's (2006) term) the subject into the scientific discourse. But, contra Althusser, I contend that the primordial subjectivation does not concern that which the human is said to be but, rather, the identification with the objectifying vantage point telling he or she what they are. This is precisely what critics of ToM miss in their otherwise justified critique that these approaches have a strong individualizing tenet and reduce the social down to cognitive issues. Ivan Leudar and Alan Costall, for example, reject the view of children and adults as "proto-scientists who treat other people with detachment, objectively, and in intellectual mode" (Leudar and Costall 2009, p. 11). However, what Leudar and Costall fail to account for is how, since modernity and the advent of the modern sciences, the modern subject can be said to have become the subject of science.<sup>6</sup> As God ceased to provide full ontological closure, science and knowledge filled this vacancy, prompting the modern subject to trade the religious grounding of its being and adopt a theoretical outlook as the basis of its engagement with itself, the others and the world.

This nexus of the close bond of subjectivation with theory and knowledge is the reason why modern psychology is inextricably bound to psychologisation: the self-reflexivity of the modern subject passes through psychology and its scientific knowledge. But does this not mean, then, that neurology will similarly fail to escape this and be, in turn, inextricably bound to processes of neurologisation? This is the only way in which we can understand the basic rationale of the research cited by Dumontheil and Blakemore: adolescents, looked upon as nascent human beings, are expected to grow into the position of a theorist. Consider, once again, the "mentalising tasks" given to test subjects: understanding irony, assessing one's own intentions, thinking about character traits, discerning intentions and emotions... In these the test subjects are tested on their skills and competencies as (neuro)psy-theorists. They are called upon to take up a distance, and assume a theoretical vantage point, from where to look upon others and the world (and on oneself, of course).<sup>7</sup> Within the field of neuroeducation, coming of age means to adopt a detached, objectifying rationalist-scientistic point of view.

We should thus ask the following question: is the position of the test person who is immobilised on the MRI-table and detached from their natural surroundings really that artificial? Of course, neurological research does not deal with the phenomenological

human in his or her life-world; it deals with the human being in its epoche. In this way, the immobilised fMRI-testsubject is the modern subject, engaging with the world only via the mediation of science and technology. Hence, the neurosciences have the subject of the sciences, the academified subject, as their principle research object, with only one problem, however: they do not know it. They hold on to the idea that they do research on the anthropological human animal, the naïve layman. This denial is particularly clear in Dumontheil and Blakemore's paper: drawing upon an experiment that demonstrates that learning in the presence of a real person is more effective than the same lesson watched on a DVD, Dumontheil and Blakemore make the following comment:

We need to ask whether online social networking, which is particularly popular with teenagers, is the same as real live interaction, or whether it might be denying the developing teenage brain important real life interactions (Dumontheil and Blakemore 2012, p. 109)?

However, to put it in a somewhat caricatured form, weren't the first people who spent hours in front of the screen, communicating above all via the computer, and having minimal "real live interaction" not precisely academic scholars themselves? Or, yet still, does the isolated youngster in front of their screen not resemble the immobilised test subject engaging in some non-real artificial activity? Hence, the obvious and frequently recited critique that fMRI-research represents the activity of people lying in a machine, not engaging truly in a real situation but, in actuality, only imagining this (e.g. Álvarez 2011), overlooks the fact that the person in the MRI-tube—watching a screen, wearing headphones and manipulating a keyboard as he or she performs a task resembling an online computer game—is actually a very realistic characterisation of the late-modern subject. Albeit, of course, that this point is overlooked by the neurosciences themselves, as their fundamental basic presupposition is that they address and have access to the real human being. It is there that they miss the subject of the sciences, which adopts a secluded and isolated academic vantage point and whose virtuality in these late-modern times is increasingly played out on screens and in cyber environments. The basic aporia of the neurosciences is that the modern subject position only appears as a kind of acting out.

This perhaps goes some way to helping us understand how in the conclusion of their paper Dumontheil and Blakemore finally direct the project of neuroeducation to its basic constellation: that of neuro-education, which I write with a hyphen in order to designate it with the meaning of education in neurology:

Perhaps the aims of education for adolescents might usefully include a focus on abilities that are controlled by the parts of the brain that undergo most change during adolescence, including those described in this review: social cognition and the understanding and awareness of the potentially different perspective of oth-

ers, abstract thinking and reasoning, and the ability to focus on one's own thoughts in spite of environmental distraction. Finally, it might be fruitful to include in the curriculum some teaching on the changes occurring in the brain during adolescence. Adolescents might be interested in, and could benefit from, learning about the changes that are going on in their own brains (Dumontheil and Blakemore 2012, p. 110).

So the authors, here, wish that adolescents would trade their immersion in video/gaming/facebook, not with real life but rather with colourful fMRI-scans and other brain imagery. This is where the neurological turn shows its affiliation with processes of psychologisation: its necessary obverse is neurologisation. In the neurological turn the late-modern subject is summoned to adopt the perspective of the neuroscientist, to share his Archimedean position, which actually amounts to the restoration of that which the neurosciences are supposed to unmask as an illusion: the unified agent looking out towards the world from his detached position in the Cartesian theatre. So, contra Jonna Brenninkmeijer's assertion that in the theory and practices of neurofeedback "a brain is created besides the self" (Brenninkmeijer 2010, p. 118), I would argue that the first thing the neurosciences create is not the brain, inasmuch as it is a theoretical vantage point from where to look at it. Brenninkmeijer's argument about the paradoxical creation of a position seemingly outside itself must be specified: this is in the first place a scientific and theoretical position. That is, the interpellative power of the scientific gaze effects a metonymy of the subject: it shifts a place and moves up to the theoretical position. Hence, the traditional critique that states that the neurosciences and brain imaging add nothing to what we already know, save telling us more or less where it occurs in the brain, neglects the fact that there is a surplus: the neurological/neurologised meta-subject having finally externalised and outsourced all psychology to its brain. If, in this way, the neurological turn remains within the same paradigm of psychology –as psychology is inevitably mirrored by psychologisation, hailing the modern subject into the position of the psychologist—then the (re)formulation of a psy-critique becomes an urgent task if we want to traverse the trickier slopes of the neurological turn.

## 5. The Resurrection of Psy-critique

However, by resurrecting psy-critique, are we not foregoing the critical potential within the neurosciences themselves? This is the position of Adrian Johnston, for whom the traditional take from the humanities on the neurological turn wrongfully assumes that its critique starts, or, has to start, from a point outside of the neurosciences:

... instead of us philosophically having to impose an external check on the sciences, especially the natural sciences, in order to leave room for some of the things we might be interested in, and which we don't feel can adequately be accounted for within the explanatory methodological frameworks of the sciences, we can, instead, taking a Hegelian dialectical phenomenological approach, argue that at this point one can step back and see the natural sciences themselves developing out of their own resources a sense of their limitations, vis a vis the things that, philosophically speaking, we are interested in. We can begin to account for how the sciences, on their own terms, are necessarily incomplete and that they can actually pinpoint the ways in which they're incomplete (Johnston 2011, p. 167).

Johnston's argument is that other sciences (psychology, sociology...), alongside the popular press, misinterpret and deform neuroscientific findings, fuelling "the fictions and falsifications of a now-pervasive scientism functioning as a branch of biopower" (Johnston 2011). Against neo-phrenology, Johnston, for example, contends that the practitioners of neuroscience actually insist on the non-localizable character of the human mind. Their attention to the "social-historical cultural surrounding environments" makes them moreover interconnect "nature and nurture, the genetic and the epigenetic, genotypes and phenotype" (Johnston 2008, p. 37). However, is it not clear from reviewing the predominant literature that the localization stance is still a dominant one? And, of course, as aforementioned, the network argument only repeats the localization paradigm. Moreover, regarding the approaches leaving room for nurture and culture, it appears that the latter will only be accounted for if traces of them are found in brain scans. The now fashionable recourse to epigenetics, mirror neurons and neuroplasticity, wanting to transcend eliminative materialism and to make room for the human and the cultural, thus always threatens to be overtaken by a still omnipresent reductionist motive: one way or another, the brain is the one size fitting it all. Think of studies indicating that social circumstances (e.g. poverty, lack of food, housing or shelter) have tangible effects on the brain: simply put, the cultural (and political) argument can only be made from the neurobiological side. Even if you want to argue that the mind is more than an epiphenomenon of the brain, the only valid proof for this will have to be grounded in neurology. This means that if, as Johnston contends, neuroscience itself harbours a critical potential, then this is not the solution, but, rather, the problem; or, at least, insofar as it claims to be able to grasp in its own terms even what is transcending it. Is the neurological, then, not the ultimate usurper, swallowing up everything that is solid, even the very possibility of understanding and/or of critique itself?

However, all this hinges on the presupposition that neurology really can stand on its own and, thus, truly is the final explanatory framework. Against this we could argue that the neurosciences, structurally speaking, need to take recourse to something outside its own domain to both orientate and ground its research and praxis. And, as point-

ed out earlier, it is here that neurology inevitably falls back on psychology. Parallelism and correlationism, the inevitable backbone of neuroscience, do not depart from natural givens, but rather from variables originating in the theory formation and praxes of psychology. Here, the problematic status of psychology as a science itself cannot but have its effects. To explain this genealogically: the advent of the modern sciences, and their enormous potential to objectify, engendered the question of modern subjectivity. As science envisions the mastery of the totality of being “without anything left over”, as Edmund Husserl said (Husserl 1970, p. 22), subjectivity actually becomes related to de-subjectivation. In contemporary terms: if you are but a function of brainwaves and evolutionary mechanisms, then in the end there is not much you or subjectivity left. Psychology thus came to light as the discipline, theory and praxis able to give form to this paradoxical emptied-out subject. But as psychology modelled its theory and praxis precisely on the objectifying paradigm (wanting to mirror the hard sciences), it only repeated the de-subjectivizing stance and, hence, necessarily and structurally missed the true, paradoxical (zero-level)subjectivity of the modern human being (De Vos 2012). Psychology, then, is the not unproblematic first informer of the neurosciences. Moreover, the prefix neuro is called upon precisely to overcome psychology’s problematic scientific status, and to unify a field ridden by an eventful history full of contradictions, schisms and anathemas. The resulting circularity—of the neurosciences coming to the rescue of psychology while it itself is structurally dependent on psychology—is the underlying structure of the neurological turn. As the neurosciences are structurally haunted by the ghost of psychology(zation), the importance of revivifying a psy-critique should be becoming clearer at this stage.

In this respect, it is interesting that when Ortega and Vidal argue that psychological and internalistic notions of personhood are substituted by somatic “bioidentities” they remark that the “neurobics literature” (a neologism contracting neurology and aerobics) reproduces “earlier commonplace self-help literature” (Ortega and Vidal 2007, p. 258). However, not only is neurobics merely the continuation of psychologising popular literature, it also demonstrates how the psychological agent of the Self (the agency deciding it is time to work on itself) is still addressed in the neurological discourses. Here, the typical redoubling of psychology (I look at myself as a psychological object) remains in place: I look at the neuropsychological thing I am said to be. The neurological turn hence should be understood as part of the psychological lineage.<sup>8</sup> But, to reiterate the central argument of this paper, the construction of that transcendental vantage point (from where the subject looks upon itself as a (neuro)psychological thing) should not be too readily dismissed as merely the side-effect of the unfortunate phenomena of the double nexus of psychologisation and neurologisation. Rather, if the fundamental aim is to reconstitute a psy-critique, and install it as a core-element in contemporary ideology critique, then the truly radical gesture is to value this Archimedean subject as a key el-

ement, both structurally and historically, of the advent of modernity. The genealogy of the psychologised/neurologised subject hovering above itself is thus essential to understanding contemporary biopower. For example, does even Johnston himself not, in fact, reserve a fundamental transcendental, and not merely immanent, vantage point in his assessment of the neurological turn? For, even though he considers the critical potential to be fully enclosed within the neurosciences themselves, he still requires us to take a “step back” to look upon the natural sciences (see full quote above). It is precisely this “step back” itself which should be the central focus of a psy-ideology critique. We should, for example, not only elucidate how the neurosciences are, as Ortega and Vidal note, “embedded in the social fabric, rather than as merely having ‘social implications’ or an ‘impact’ on society” (Ortega and Vidal 2007, p. 256), for as true as this is, the claim to be above the social should be understood in its own right. That is, the modern subject, as a subject of the sciences, is called upon via the processes of academisation, psychologisation and neurologization, to re-join that very Archimedean vantage-point. This point of view from nowhere, the un-embedded point, the ghost of the Cartesian subject, is precisely the origin of the sciences themselves. The emptied-out subject, fully objectified with all its particularities attributed to the general structure of neural matter, provides the alleged neutral point for science to ground itself. In other words, the (neuro)psychologised subject is the backbone of the sciences. Psychologisation/neurologisation actually produces the conditions of (im)possibility of the sciences, via the production of the neuropsychologised subject who looks at itself as a neuropsychological object.

It is only in terms of this Archimedean surplus subject that the dynamics of contemporary biopolitics make sense. A case in point, here, is the discipline of neuro-education. For example, the Organisation for Economic Co-operation and Development (OECD), despite attacking the so-called neuromyths and the inappropriate use of the neurosciences in education, considers it necessary that the public should be educated about the “gains due to cognitive neuroscience” (OECD 2002, p. 169). Neuroeducation, the implementation of neuroscience in education, hence should be taken literally: everyone (the pupil, the teacher, the parents, the general public) should be given lessons in neurology. Neuroeducation is neuro-education. If psychologisation hailed everyone into the psychology class (De Vos 2012), then neurologisation represents the draft into the neurosciences class. Contemporary biopolitics, then, is not an issue of “the fictions and falsifications” of bad theory and bad popular media (see Johnston), it is rather an issue of theory itself. The neurosciences are inextricably interwoven with neurologisation, creating a surplus subject in the very excess of being hailed: “look, this is what you are” engenders the concomitant response, “really, is that me?” The ideological move par excellence is to be located precisely in this claim to be merely lifting the veils and revealing the nature of mankind. This is where the dynamics of redoubling is missed: it is the re-



fusal to acknowledge that in the process of neurologisation the neurological subject/object becomes a pupil in neurology. For example, Marco Iacoboni, one of the members of the Italian team of neuroscientists that launched the concept of mirror neurons, rather inconspicuously argued in an interview for the popularization of the scientific insight that we are “wired for empathy”:

. . . this explicit level of understanding of our empathic nature will at some point dissolve the massive belief systems that dominate our societies and that threaten to destroy us (Iacoboni 2007).

Similarly, Steven Pinker cites Anton Chekov, “(m)an will become better when you show him what he is like” (Pinker 2008, p. 37). What both Iacoboni and Pinker show is that the neuropsychology-claims to relevancy in matters of politics is not merely about implementing (neuro)scientific knowledge on the nature of mankind but, rather, about showing man his alleged true nature.<sup>9</sup> The fact that a politics based on the nature of man, has to pass through education, demonstrates that we are dealing fully with biopower: producing and calling into life the late-modern subject, sitting in the Archimedean class, watching the blackboard, or rather an interactive whiteboard portraying colourful brain scans.

## 6. Conclusions: The Truth of the Mereological Fallacy

Whether in popular appropriations of the neurosciences or serious scholarship in the field of neuroeducation itself, everybody sooner or later ends up in the class-room and becomes a scholar in neuroscience. In a paper by Darcia Narvaez on “moral neuroeducation”, for example, we cannot but notice the grand écart between, on the one hand, serotonin, glucocorticoid, DNA synthesis and the hippocampus, and, on the other, “agreeable personalities” and “child cooperation and behavior regulation” (Narvaez 2012, p. 148). Neuro-education, educating the so-called layman into neuroscientific theories, is the paradigmatic attempt to close this gap. With Narvaez, this becomes clear as she defines morality within a spectrum of development from “novice to expert”. Narvaez urges the layman to read books on “mindfulness” and “socialize with people who cultivate it” (Narvaez 2012, p. 150). She thus speaks of “expertise”, “capacities”, “know-how”, “flexible innovative responses” (Narvaez 2012, pp. 149–150). Note here how the underlying humanistic psychology shows its true face: portraying the pupil as an agent involved in “information processing, judging action, taking action” seems to be, far from a description of moral development, above all the description of the ideal information

worker within our digital era! Using current fashionable-terms such as epigenesis and plasticity, Narvaez writes:

In contrast to passive epigenesis (what I call) active epigenesis (or active plasticity) refers to the ability of the thoughtful individual to choose activities that transform the self. Individuals can modify brain malfunctioning through a change in activities which modify neuronal functioning (Narvaez 2012, p. 149).

Or, phrased otherwise: fine-tune your brain, or, even, fool your brain in order to make profit, and extract surplus-value from it. What is omitted in such positions is that the real surplus is the creation of a vantage point, a new, albeit empty, subject-position from where the levers are pulled. Narvaez, unwittingly, describes this as she defines mindfulness: “It means pulling oneself out of automatic responses to familiar contexts and paying attention to the newness in the situation” (Narvaez 2012, p. 150). Do we not witness here the return of the homunculus, the little man inside our head? While such an agency is generally denounced in the neurological turn as it presupposes some extra-neurological transcendental notion, neuro-education shows that this Cartesian spectre is still haunting the neurosciences. The unacknowledged new homunculus, however, does not merely scrutinize sensory input and information flows, but actually is in control of the buttons that really matter: switching brain regions on or of, controlling chemical flows, if not by “singing, playing, dancing, laughing”, as Narvaez has it (Narvaez 2012, p. 151), than with psychofarmaca.

Is this version of “neurobics” not a consequence of the pitfall of the so-called mereological fallacy that is said to be threatening both popular and scholarly approaches to neuroeducation? This fallacy involves ascribing to the parts of a thing attributes that can be ascribed only to the thing as a whole. That is, psychological attributes are allegedly attributed to the brain while they can be intelligibly ascribed only to the human being as a whole (Bennett and Hacker 2003). This could be considered as the point of origin of the construction of a homunculus supposed to be capable of influencing and training its brain. If your brain is the one doing the thinking, feeling and knowing, then this calls to life an extra-agency mastering the brain and steering the thinking, feeling and knowing. In his paper, “Three requirements for justifying an educational neuroscience”, George G. Hruby considers the mereological fallacy as a touchstone to differentiate between the “popular industry in brainbased educational methods, workshops, and materials” and the “serious scholarship and professional organizations dedicated to the coherent bridging of the neurosciences with educational research” (Hruby 2012, p. 2). Attributing behaviours anthropomorphically to the nervous system, he writes, would be like saying that one’s digestive system is having dinner (Hruby 2012, p. 6). For Hruby, the intuition that our brain does the learning, reading etc., stems from the computer metaphor of the cognitive sciences. Against the latter he argues:

For all their sleek interactivity, computers are texts: purely symbolic, from the icons on the desktop all the way down to the Boolean juggling of binary addresses denoting memory registers (Hruby 2012, p. 6).

Hruby challenges this by conceiving of the human being as the “meaning-maker”. However, as I have attempted to demonstrate in this paper, perhaps the alleged logical fallacies of the popularizations of the neurosciences do, in fact, show us something important underlying so-called “serious scholarship”. Is there, for example, not a grain of truth in the fallacy which equates human beings with computers? The human being could be understood, after all, as a symbolic machine connected to the lifeworld in a symbolically mediated way. This means that one could, in actual fact, have the experience that it is one’s bowels which are demanding to be fed: the grumbling signals that the tummy is hungry. The subject can thus hardly be said to be the meaning-maker: meaning, rather, comes from the outside. The subject itself is but a point external to meaning; at the most it is the mere subjectum (the carrier) of meaning. Jacques Lacan’s dictum “a signifier represents the subject for another signifier” (Lacan 1978, p. 207) can help our attempts here to think of the subject as the relais between signifiers. The subject itself always falls between two poles: it does not coincide with its attributes, it is itself exempt from the realm of meaning. Moreover, from the advent of modernity and the modern sciences onwards, the realm of meaning is the jurisdiction of the sciences. As Lacan argued, the discourse of the master was replaced by the discourse of the university (Lacan 2006). That is, knowledge became the principal term in the hegemonic discourse of power. This is a situation whereby it is no longer only the scholar but virtually everybody else too that knows that when the stomach growls this is due to muscle contractions of the digestive system. The modern subject is both the object of the paradigmatic call of science “look, this is what you are”, and the subject-bearer of this hailing: “oh yes, this is what I am?” Following from this, the subject is the point between two banks, a view from nowhere, a ghost in the machine which hovers (as if in an out of body experience) above its own brain/bowels. The failure to acknowledge this subject qua the view from nowhere is perhaps why Hruby describes the serious educational neuroscientists as having “the easy expertise in their twin fields to provide sage counsel” (Hruby 2012, p. 10, *my italics*). That is, the unacknowledged Archimedean empty subject returns in the imagery of the devoted, wise and probably bearded professor in education who, from his academic panoptical tower, provides the ontological closure for the as such groundless neurosciences.

This might, ultimately, be the true bearing of the mereological fallacy. The issue is not as much, as Bennett and Hacker contend, that it “makes no sense to ascribe psychological predicates (or their negations) to the brain” (Bennett and Hacker 2003, p. 72), a point condensed by Frank Vander Valk as “the brain has no psychology” (Vander Valk 2012, p. 11), rather, the crucial question is: is there anything else which would have a psycholo-

gy? As aforementioned, due to the fundamental interpellative paradigm of the (neuro)psy-sciences a surplus subject sees light which itself has no psychology. It therefore makes no sense to ascribe psychological predicates to no matter what or whom. As recently psychology migrated from the person or the self to the brain, it shows itself to have always been a symptom, the symptom of the subject of the sciences. This means that one should not mistake the neurosciences as a threat to subjectivity. For, precisely via its popularizations and alleged misappropriations, the neurological turn reveals itself to be a vigorous attempt to save subjectivity, to build it up, to inflate it, or, to use the appropriate term here, to flesh it out. Just consider how the neurosciences (cannot but) deny the possibility that subjectivity can be flawed in its own right: the subject does not lose track of itself, it is always on track; when it is off track, some brain lesion or dysfunction is present, or will be found. As for neuroscience, there is nothing wrong with the subject, it is the ultimate attempt to safeguard the ego and the Cartesian cogito.

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## Footnotes

1

Consider how articles on ADHD often start with the explicit statement that it is not a psychological disorder (Zou et al. 2012, p. 403), or how this message is repeatedly conveyed to teachers (Hanks 2010, p. 91) and parents (Roberts 2006, p. 18).

2

Literally: “Too mad”. In Dutch it is also an exclamation utterance, meaning “awesome” or “cool”. See the website: <http://www.sad.be/tegek/>.

3

By ‘psy-critique’ I mean all the approaches which critically engage with the psy-disciplines (questioning their scientific status, their conceiving/construction of a subject, their social and political meaning). Besides the Foucaultian perspectives (e.g. Rose 1996, who coined the term psy-disciplines, disciplines starting with psy-, such as psychology, psychiatry, or psychotherapy), the most important are the Marxist, phenomenological, humanistic and psychoanalytic strands of critiques of the psy-sciences (for an overview see Parker 1999, 2007).

4

One should acknowledge, to the authors credit, that many others when dealing with the same task of interpreting similar data, often trade this tentative way of writing for a firm and unambiguous style.



5

The assumption that people spontaneously theorize is most often explained from an evolutionary perspective (Leudar and Costall 2009).

6

See Jacques Lacan's understanding of the modern subject as the subject of the sciences (Lacan 1966).

7

Perhaps this is also why the topic of irony takes centre-stage in this kind of research; it also testifies to a detached point, on the margins so to speak, from which to look upon the sublunary.

8

As already claimed by Scott Vrecko (Vrecko 2010).

9

Although Iacoboni would, of course, argue that this educational dimension connects to brain processes themselves, as he says: "It seems that people 'recognize' how their brain works, when they are told about it" (Iacoboni 2007). But, then again, the unaddressed question is why people have to be told about it, why a meditative level is necessary?