

CRITICAL NEUROHERMENEUTICS*

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ABSTRACT: The article supports the proposal for a critical neurohermeneutics. For this purpose it begins by considering the recently coined term «neurohermeneutics» and the various meanings it contains. The article then explores neurohermeneutics as the hermeneutics of neuroscience, and identifies some of the main limitations of naturalistic neuroethics that arise from the deficit of critical hermeneutics in its approaches. Finally, critical hermeneutics is defended as the necessary foundation of neuroethics.

KEY WORDS: Neurohermeneutics; Neuroethics; Neuromyth; Habermas.

Neurohermenéutica crítica

RESUMEN: El artículo defiende la propuesta de una neurohermenéutica crítica. Para ello parte del término recientemente acuñado «neurohermenéutica» y de los diversos significados que éste contiene. Centrándonos en la neurohermenéutica como hermenéutica de la neurociencia, destacamos algunas de las principales limitaciones de la neuroética naturalista como consecuencia del déficit crítico-hermenéutico de sus planteamientos. La «fenomenología de la autoría responsable» que Habermas presenta en algunos de sus últimos escritos nos sirve de marco desde el que poder ir perfilando nuestro modelo de neurohermenéutica crítica y así poder superar las deficiencias de la neuroética naturalista.

PALABRAS CLAVE: neurohermenéutica; neuroética; neuromito; Habermas.

1. FROM PHILOSOPHICAL HERMENEUTICS TO PHILOSOPHICAL NEUROHERMENEUTICS

Since its emergence in the seventeenth century, the word *hermeneutics* has referred to the science or art of interpretation. Until the end of the nineteenth century, it usually took the form of a theory that promised to lay out the rules governing the discipline of interpretation [...] *Philosophical* hermeneutics, by comparison, is of very recent date.¹

The term «hermeneutics» is of Greek origin and was actually coined in the seventeenth century to refer to what was formerly called *ars interpretandi*, and that brought together branches such as criticism, exegesis and philology. It is then that the first treatises on the general art of interpretation emerged to go beyond the framework of specialised hermeneutics, understood as techniques dedicated in particular to biblical writings or works of classical antiquity. It was, however, in the nineteenth century with authors such as Schleiermacher, August Boeckh, Bratuschek, Droysen and, above all, Wilhelm Dilthey and Georg Misch, that hermeneutics broadened its interpretive horizon, gaining

* This publication has been supported by the Scientific Research and Development project PID2019-109078RB-C22 funded by the Ministry of Science, Innovation and Universities.

¹ GRONDIN, J., *Introduction to philosophical hermeneutics*, New Haven/London, Yale University Press, 1994, pp. 1-2.

progressive awareness of and reflection on the historical dimension, and projected as a scientific methodology of the spirit (*Geisteswissenschaften*)².

However, the fundamental shift in the way hermeneutics is currently understood arrived with Heidegger, and especially with Gadamer. At this point, hermeneutics no longer simply designated a practice, a theory or a methodology, but essentially a fundamental characteristic of the human being. It was a fundamental and radically philosophical turn because hermeneutics became a universal feature of the human condition and with it, of all philosophical activity that is known from the interpretative dimension of the human being.

With the passage of time the presence of philosophical hermeneutics has gained increasing relevance and prominence in the world of philosophy. The Gadamerian matrix of philosophical hermeneutics has been applied to analyse a range of issues and problems that affect the human being and our world today. It is not only that hermeneutics has something to say about these issues from a particular point of view of the human sciences, but that saying or talking about something, also from the natural sciences, implies the human capacity to interpret. This capacity is clearly enlightened by philosophical hermeneutics. It is therefore hardly possible to speak of our current conception of the world without referring (explicitly or tacitly) to the interpretative dimension of the human being.

Among the issues that have come to the fore is the impact of the neurosciences. In the last two decades there has been a major proliferation of disciplines accompanied by the prefix «neuro» (neuroethics, neuropolitics, neurophilosophy, neuroeducation, neurodidactic, neuroaesthetic, neurorhetoric, neuroeconomy, neuromarketing, neurolaw, neurotheology, and so on)³. The presence of «neuro» is not limited to academic circles or specialists, but is shaping a new conception of the world that is infiltrating a peculiar way of understanding it and of understanding ourselves, in which the brain is taken as the centre of operations, as the core of all kinds of human activity.

It might seem that any discipline can be understood under the aegis of the neurosciences. Undoubtedly, «neuro» is topical and, in my opinion, has given rise to the urgent hermeneutic-philosophical problem of whether the new science of the brain is capable of giving reason to everything to the point of becoming the new common language and the centre of operations of any discipline. All

² For a historical reconstruction of the term hermeneutics, see the work of GRONDIN, J., *Introduction to philosophical hermeneutics*, op. cit. For this purpose the work of FERRARIS, M., *History of hermeneutics*, Humanities Press, 1996, is also illustrative. On philosophical hermeneutics see also CONILL, J., *Ética hermenéutica. Crítica desde la facticidad*, Madrid, Tecnos, 2006. The work of Hans-Georg Gadamer, *Truth and method*, is a paradigmatic reconstruction of the history of hermeneutics.

³ The number of words generated is already legion and includes such diverse examples as neurodeterminism, neuroexceptionalism, neuroessentialism, neurorealism, neuroseduction or neurohype. Cf. ILLES, J., «Neurologism», *American Journal of Bioethics-Neuroscience*, n° 9 (9), p. 1, 2009; LILIENFELD, S. O.; ASLINGER, E.; MARSHALL, J. and SATEL, S., «Neurohype» in: *The Routledge Handbook of Neuroethics*, London, Routledge.

areas of knowledge would be rooted, so to speak, in the neurosciences, each according to its modality. Several questions therefore arise: are neurosciences the new language of our time? Should we move on to speak or even replace the philosophical hermeneutics with a «philosophical neurohermeneutics» at the height of these «neuro» times? What relationship is established, or rather must be established, between the philosophical hermeneutics and the neurosciences? Should we now assume that we are facing a new hermeneutic paradigm modulated by the neurosciences? As we move from a plurality of possible interpretations to a single valid explanation in terms of neuroscience, does this paradigm imply a new version of hermeneutics, or a dissolution of the hermeneutic dimension?⁴

The relationship between philosophical hermeneutics and neurosciences is complex and multifaceted. I do not intend to explore each one of its angles in this paper. However, there are many questions that should be raised and analysed, because depending on the response they elicit, a particular way of doing science and doing philosophy will result. The clarification of the concepts continues to be one of the main tasks of philosophy and in what follows I analyse whether it is possible to speak of a «philosophical neurohermeneutics» and more precisely a «critical neurohermeneutics», and in what sense or senses it is possible to do so.

The term «neurohermeneutics» is also beginning to appear in the literature. As in the early days of neuroethics, when the distinction was made between the neuroscience of ethics and the ethics of neuroscience⁵ at the now famous San Francisco conference in 2002, the hermeneutics of neuroscience has also been distinguished from the neuroscience of hermeneutics⁶. The hermeneutics of neuroscience refers to exploring the contribution of the hermeneutical approach by analysing what particular interpretation of the world and of ourselves the neurosciences offer. It therefore seeks to highlight the hermeneutical presuppositions of neuroscience.

In contrast, the neuroscience of hermeneutics refers to discovering the neural bases of our definition of human beings as interpretative beings capable of understanding themselves. This second approach concerns the ability to detect the brain mechanisms involved in creating stories, which Kay Young and Jeffrey Saber have called the «neurology of narrative». Studies using brain

⁴ Nearly three decades ago Gianni Vattimo referred to hermeneutics as the «new koine» of our time. Cf. VATTIMO, G., «Hermenéutica: nueva koiné», in: *Ética de la interpretación*, Paidós, Barcelona, 1991, pp. 55-71.

⁵ Cf. ROSKIES, A., «Neuroscience for the new Millenium», *Neuron* 35, 2002, 21-23. In view of the investigations in more than fifteen years since its emergence, it is undoubtedly a very fruitful distinction that has served to generate different ways of analysis and research. Neuroethics as a neuroscience of ethics is not only an applied ethics inscribed within the framework of bioethics, but it also implies and involves philosophical reflection on fundamental issues of ethics such as identity, recognition, freedom, the concept of morality, and so on.

⁶ Cf. DOMINGO, T., «Neurohermenéutica», in: *Pensamiento*, Vol. 73, 276 (2017), pp. 563-568.

scans such as electroencephalography (EEG) or functional magnetic resonance imaging (fMRI) allow us to generate a vision, according to these authors, «of how the brain narratively organizes its experience». They go on to state that «Recent advances in cognitive neuroscience suggest that the creation of narrative in the human central nervous system is mediated by a regionally distributed neural network»⁷. In this line, authors like Steve Reyna have alluded to the parts of the brain involved in the interpretation as the «neurohermeneutic system of interpretation» and have tried to find the link between the biological substrate of the brain and the cultural dimension of interpretation⁸.

In this work I will focus on neurohermeneutics as a philosophical hermeneutics of neuroscience. I introduce the adjective *philosophical* to emphasise that the hermeneutic analysis of neuroscience does not designate only a particular practice or methodology but the fundamental characteristic of the human being as an interpreter and configurer of various theories and ways of understanding the world and nature.

2. THE HERMENEUTICAL DEFICIT OF (UNCRITICAL) NATURALISTIC NEUROETHICS

Among the diverse range of «neuro» disciplines, neuroethics has gained special relevance and, within it, the neuroscience of ethics. Ethical questions are once again being posed from new approaches supported by the neurosciences. In this process, interesting enquiries have arisen about the relationship between science and philosophy, but a particular type of ethics is also being shaped and informed by neuroscientific research.

It would be unjustified to ignore the contribution of neuroscience to the study of ethical issues such as morality, human nature, freedom, identity, recognition, rationality or emotions, among others. In my view, philosophy in general and ethics in particular cannot turn its back on scientific advances⁹. However, from the other, philosophical, side I think it is crucial to stop and ask whether the neuroscientific research that seeks to clarify ethical issues is and has been able to enlighten them adequately. Has it considered the scope of morality in all its breadth and complexity, without incurring in distorting reductionisms? On this point, I consider that some neuroethical versions suffer from a hermeneutical deficit. This is the case of (uncritical) naturalistic neuroethics, which consists in reducing the explanation of moral behaviour to the neurophysiological mechanisms described by the neurosciences. The

⁷ Cf. YOUNG, K. & SABER, J. L., «The neurology of narrative», in *SubStance*, 94/95, 2001, p. 188.

⁸ Cf. REYNA, S., «What is interpretation? A cultural neurohermeneutic account», *European Journal of Anthropology*, 48 (2006), 131-143; REYNA, S., *Connections: brain, mind and culture in a social anthropology*, Routledge, London/New York, 2002.

⁹ GRACIA, J., «What can philosophers learn from neuroscience», in: HANNA, P., *An Anthology of Philosophical Studies*, vol. 10, Athens, Atenier, pp. 27-36.

naturalism underlying this neuroethics is effectively reductionist because, on the one hand, it reduces what there is to the physical universe and, on the other hand, it considers that the only truths and the only substantive knowledge is that which comes from natural facts¹⁰.

The neuroethics resulting from the naturalist approach is reductionist and is marked by a clear hermeneutical deficit since it considers that the only valid and solvent explanation of morality is that deriving from the neurophysiological bases («natural events») and does not accept that in addition to the natural scientific method, there are other complementary approaches which can provide an adequate account of human morality. Can we circumscribe the whole scope of morality in the human being to «natural events»? Doing so implies serious problems for human beings' ability to understand themselves. I now look briefly at some of these problems.

The first problem deriving from the (uncritical) naturalistic neuroethics is that of freedom. Is it possible to give due account of freedom from the neuroscientific approach? Because freedom cannot be demonstrated by the natural method of neuroscience, does it lead to the denial of its existence in the human being?¹¹

The second problem concerns responsibility and neuroscience. Cognitive science explains the causal relationship between human action and the physical body (the brain). This relationship would have to be analysed if explaining the causes of the action, eliminating the distinction between cause and motives, does not prevent us from clearly illuminating what it means to be responsible¹².

A third problem with naturalistic approaches is that they tend to confuse

¹⁰ A current formulation of such naturalism could be expressed as the position that holds that nature —understood as the physical universe— is all there is; second, that the only basic truths are the truths of nature; and, third, that the only substantive knowledge is that of natural facts. Cf. AUDI, R., *La percepción moral*, Madrid, Avarigani, 2015, p. 28. As Habermas recalls, «The ontologization of the knowledge by natural sciences forms a naturalistic image of the world and reduces it to hard facts». Therefore «that is not science, but bad metaphysics». Cf. HABERMAS, J., *Entre naturalismo y religión*, Barcelona, Paidós, 2006, p. 214.

¹¹ The conclusions of Benjamin Libet's experiments carried out from neuroscientific approaches are well known. Cf. LIBET, B., «Do we have free will?», in: *Journal of Consciousness Studies*, 6, n° 8-9, 1999, pp. 47. Many authors have rebutted his conclusions, but this is not the place to examine them. Later in the paper I refer to critical neurohermeneutics as a way of overcoming naturalism, on the one hand, and an inflationary concept of freedom on the other.

¹² Several authors in the conceptual matrix of philosophical hermeneutics have criticised the deficiency of an approach devoid of hermeneutical foundation. Cf. HABERMAS, J., *Entre naturalismo y religión*, Barcelona, Paidós, 2006, p. 194 and ss. More recently, in the line of Paul Ricoeur's phenomenological hermeneutics we find criticism of certain neuroscientific expositions. According to this author, only in the framework of the narration does the human being learn the reasons for being responsible; cf. DIRECKXSENS, G., «Responsibility and the Physical Body. Paul Ricoeur on Analytical Philosophy of Language, Cognitive Science, and the Task of Phenomenological Hermeneutics», in: *Philosophy Today*, vol 61, issue 3, Summer 2017, pp. 573-593.

neural bases with the ethical foundations of moral behaviour. As a result, is neuroethics not left on the brink of the famous naturalistic fallacy?¹³

A fourth problem is identity and recognition. Human prosociality is frequently explained from evolutionary approaches¹⁴. However, it would be convenient to pause and determine whether the biological capacity of the human being to reciprocate is the same as the ethical category of recognition as it has been understood and defended from ethical theories¹⁵.

Fifth, some authors also tend to bundle norms and moral values with «social norms and values»; do they really reduce ethical values to socially agreed norms? Under the aegis of naturalism, morality is confused with prosociality, which in turn is conflated with evolutionarily described natural facts¹⁶. Undoubtedly, morality has a lot to do with the social dimension of the human being, but is ethics reduced to the pre-conventional and conventional stages of moral behaviour?¹⁷.

A sixth problem involving naturalistic neuroethics is what can be understood by justice and if justice really is understood once efforts have been made to naturalise it. Does justice not lose its meaning? Again, the problem that arises is a reduction in normative capacity that makes attempts to regulate the action beyond the conventions reached by a certain group a fatuous exercise. A naturalised idea of justice entails a serious hermeneutical deficit to the extent that it contradicts and eliminates the pretensions of validity that are intrinsic to the agent's understanding of human behaviour.

These are just some of the main problems presented by naturalistic neuroethics. It should not be forgotten that the neuroscientific perspective can provide important knowledge about some aspects involved in human action, such as the brain mechanisms that make such action possible from a neurophysiological point of view. But this is only a point of view characterised by the observer's perspective on empirically observable facts. Of course it is not the only one and perhaps not (the most) adequate, depending on the objective. It is hermeneutics that allows us to distinguish the methodological perspective of the natural sciences from other possible methodologies to give a reason for

¹³ Cf. AYALA, F., «The Biological Roots of Morality». *Biology and Philosophy* n° 2 (1987), pp. 235-252; CORTINA, A., *Neuroética y neuropolítica. Sugerencias para la educación moral*, Madrid, Tecnos, 2011, pp. 77-96; GRACIA, J., «¿Incurre la teoría del proceso dual del juicio moral de Joshua Greene en falacia naturalista?», *Pensamiento* 72 (2016), n°. 273, pp. 809-826.

¹⁴ An example of these naturalistic neuroethical approaches can be found in DE WAAL, F., CHURCHLAND, P. S., PIEVANI, T. y PARMIGIANI, E., *Evolved Morality. The Biology and Philosophy of Human Conscience*, Brill, Leiden, Boston, 2014.

¹⁵ Cf. GRACIA, J., «De la reciprocidad neurobiológica al reconocimiento ético a través de la fenomenología hermenéutica», in: SYLLA, Bernhard (ed.), *Intencionalidade e cuidado*, Riberão, Humus, 2017, pp. 257-268.

¹⁶ A good example of this can be found in CHURCHLAND, P., *Braintrust. What neuroscience tell us about morality*, Princeton, Princeton University Press, p. 10.

¹⁷ In Kohlberg's line, I believe it is important not to reduce ethics to pre-conventional or even conventional stages, especially considering the importance of conscience (and not just group pressure) in determining how people behave.

morality. In this way, hermeneutics arises as a critical instance against the pretension of some naturalistic neuroscientific versions that reduce the scope of morality to empirically testable natural facts.

3. CRITICAL HERMENEUTICS AS THE FOUNDATION OF NEUROETHICS

At this point it is important to note that critical hermeneutics contributes to a more adequate understanding of the neuroscientific explanation. In the light of hermeneutics the neuroscientific explanation is understood and recognises itself as one way, but not the only way, of explaining morality. This aspect is not to the detriment of neuroscience's explanations of phenomena that occur in the brain system as a base and centre of operations of the activities of the human organism. However it does imply an unquestionable gain in terms of reflexivity and therefore a critical way to prevent us from falling into what we might call a neuromythical understanding of the world. Let us examine the gains of considering the critical instance of neurohermeneutics.

Among the undeniable achievements of neuroscientific research is the rebuttal of certain «neuromyths» that have infiltrated people's way of thinking and have been fuelled by ignorance of the research itself, by inappropriate ways of disseminating science or by the desire (naive or deliberate) to apply it, without further scientific affirmations, to practical contexts in order to develop action guidelines that have a considerable impact on people's ways of life¹⁸.

In the face of neuromyths, neuroscientific research has rightly called for rigour and caution. It is part of the ethics of neuroscientific research to enquire into the emergence of neuromyths and the commitment to the precautionary principle, and the rigorous requirement to detect and avoid them¹⁹. Indeed, rigour and caution are two indispensable elements of scientific explanation that should always be kept in mind to prevent new, distorted neuromyths from

¹⁸ For instance, in the field of education, in its 2002 report the OECD warned against the emergence of neuromyths: «With the advent of functional imaging technology, cognitive neuroscience is beginning to produce important research on the neural foundations of cognitive performance. Current research results have sparked a tremendous amount of commentary and speculation among scientists, researchers, education specialists, and policymakers. Since such research proves to have merit, many want to know how educational practice can be improved or enriched by the application of these research findings. As a result of both pressure to improve overall school performance and excitement and interest about education that could be brain-based, many myths and misconceptions have arisen around the mind and brain outside of the scientific community. Teachers and educational specialists are eager to put into practice what they have read in the popular press, and policymakers want to enact effective educational policy by using research-based information». OCDE, *Understanding the brain*, Paris, 2002, pp. 69-70.

¹⁹ Cf. *The brain and learning*, OECD Publications Service, Paris, 2007; and HOWARD-JONES, P., *Introducing Neuroeducational Research. Neuroscience, education and the brain from contexts to practice*, Routledge, Oxon, 2010.

appearing. Hence a rigorous and cautious neuroscientific explanation, duly contrasted by empirical observation, will never be placed on the same level as another that lacks these elements and upholds affirmations that are not endorsed by experimentation.

But in turn, critical hermeneutics warns that the neuroscientific explanation itself can become a neuromythical conception of the world, because if the neuroscientific approach does not take consciousness of itself as an interpretation of the world, it will end up identifying with the world itself. This occurs when the neuroscientific understanding of the world is considered to be the only valid understanding that reflects the world as it is (and not the natural, empirically observable world). Paradoxically, science itself, which emerged to overcome previous mythical conceptions of the world, would end up generating its own myth, precisely because of its lack of reflexivity. If this were to happen, we might say that we were witnessing a new form of «reification of the image of the world»²⁰.

Faced with this mode of naive or uncritical neuroscience, the critical hermeneutics approach contributes to generating a reflexive and critical neuroscience that also affects its scope and limits. Critical hermeneutics allows us to see not only that neuroscientific approaches are amenable to revision and criticism, but that the image of the neuroscientific world is neither the only possible nor the most adequate lens through which to focus on the whole of the world, for example, in the field of morality. In fact, it is essential that the neuroscientific discourse does not aim to go beyond the «practical barriers of naturalistic self-objectification» but often recognises in the background the access hermeneutics gives to the world of life.

Die praktischen Schranken der naturalistischen Selbstobjektivierung bestätigen die Hartnäckigkeit eines epistemischen Dualismus, der nicht in der Differenz zwischen Lebenswelt und objektiver Welt als solcher, sondern in dem Umstand begründet ist, daß der hermeneutische Zugang zur Lebenswelt ausschließlichen Charakter hat, also nicht durch einen anderen ersetzt werden kann. Gewiß, das Sprachspiel des physikalischen Messens muß wie alle anderen lebensweltlichen Praktiken durch Teilnahme eingeübt werden, bevor sein propositionaler Gehalt in der Form expliziter Regeln beschrieben und «verstanden» werden kann²¹.

²⁰ Here I use a well-known expression from Habermas not only to counter the scientific explanation of the mythical explanation, but also to emphasise that the neuroscientific image itself can come to be reified. Cf. HABERMAS, J., *Teoría de la acción comunicativa I*, Madrid, Taurus, 1987, pp. 82-99. The problem is not to determine whether there are alternative standards of rationality, nor the limitations of a principle of hermeneutical charity, but whether neuroscience itself has constructed an image of the world that leaves out the moral dimension irreducible to empirical nature and becomes the standard of cognitive-instrumental adequacy.

²¹ HABERMAS, J., «Von den Weltbildern zur Lebenswelt», *Philosophische Texte*, Band 5, Frankfurt, Suhrkamp, pp. 263-264

Critical hermeneutics allows us to overcome the drawbacks of a neuromythical conception of the world by focusing precisely on the reflexivity and critical nature of any interpretation. The way in which science is imbricated in the world of life is still problematic, and setting out to simply replace the world of people's lives with a specific neuroscientific vision of the world involves the devaluation of substantial traditions that have given and continue to give meaning to people's existence, and implies an irreparable loss in terms of the agents' understanding of themselves and their experiences²². I do not doubt that these particular traditions and conceptions of the world might sometimes call for revision, and the explanations offered by scientific theories can contribute directly or indirectly to this, but they must always be properly contextualised. It seems that neuroscience is not the most appropriate candidate to review the existential self-understanding of the experiences of the agents themselves. Rather, I believe it is the critical hermeneutics of the social and human sciences duly applied to the different spheres of society that really contributes to the emancipation of society in all its spheres.

In this regard, neuroscientific explanations are far from neutral, and when they aspire to reach all areas of the world of life, they lead to the subordination of a unilateral rationality and restrict this world to the empirical-instrumental. Naturalistic neuroscientific research is not enough to combat the closed, unreflective and uncritical nature of neuromyths. Any neuroscientific explanation must be grounded on the aegis of reflexivity and critical self-understanding, so that it becomes aware of its scope and its limitations.

The way to overcome neuroethical naturalism as a reified image of the world is to advocate a critical neurohermeneutics. We speak of critical neurohermeneutics (not simply neurohermeneutics) because the pretensions of validity and the moment of the unconditioned are part of the self-understanding we have as agents. This point of view is not that of the observing scientist who develops neuroscientific theories (according to the natural scientific method), but neither that of the relativist who eliminates both objective truth and intersubjective validity. It is rather the critical point of view of the moral

²² This phenomenon was denounced by Habermas as «colonization of the world of life» alluding to the analyses of Marx, Weber and Parson. Cf. HABERMAS, J., *Teoría de la acción comunicativa*, Madrid, Taurus, 2003, pp. 451ss. However, in the phenomenological matrix of hermeneutics it was originally exposed almost a century ago by Edmund Husserl in *The crisis of European sciences and transcendental phenomenology*. The image of the real world provided by «objective science» is concretised in the exclusion of issues such as the meaning of the world or the values of life. If the natural sciences are concerned only with the facts and their relationships and this vision has become the predominant conception in the ordinary world, then this world itself has derived from the product of science, nullifying the potential and significant wealth of life itself. Phenomenology and hermeneutics reveal the need to become aware and reflect that the place of objective science is not that of the world of life. The crisis of objectivism lies precisely in having renounced one's own scientificity by reducing the truth to natural facts and a mathematical ideal of accuracy. Cf. HUSSERL, E., *The crisis of European sciences and transcendental phenomenology*, Evanston, Northwestern University, 1970. §§ 33-ss.

agent knowing that, as an embodied agent, they understand that their moral behaviour does not attend to neuronal mechanisms, but to their responsibility for themselves in their own body.

Die Grenzen naturalistischer Selbstobjektivierung wird mit Beschreibungen überschritten, unter denen sich Personen nicht mehr als Personen wiedererkennen können. Naturwissenschaftliche Beschreibungen beziehen sich —über die Abstraktionsstufen theoretischen Begriffsbildung vermittelt— auf ein raumzeitlich identifizierbares und grundsätzlich nomologisch erklärbares, also deterministisches Geschehen [...] Die Schwierigkeit besteht darin, daß sich die Sprachspiele, Vokabulare und Erklärungsmuster, deren wir uns in solchen Fällen jeweils bedienen müssen, nicht aufeinander reduzieren Lassen²³.

CONCLUSION

Critical neurohermeneutics allows us to overcome the deficiencies of (uncritical) naturalistic neuroethics because it is grounded in critical hermeneutics. Critical neurohermeneutics starts from the recognition of the hermeneutical presuppositions of understanding and therefore does not take for granted that natural facts are the reality itself. On the contrary, it recognises the undeniable contribution of the natural scientific method to understand the cerebral mechanisms underlying moral conduct, but without reducing the moral conduct to these mechanisms. Rather, its foundation lies in critical hermeneutics without neglecting the consideration and analysis of the moral reasons of the agent.

But, secondly, recognising the foundation of critical hermeneutics for neuroethics or moral neuroeducation allows us to overcome a neuromythical conception of the world. Uncritical naturalism can easily become a reified image of the world. Faced with this, critical hermeneutics allows a greater awareness and reflexivity of the place that corresponds to the neuroscientific contribution in the way it explains natural facts.

Critical neurohermeneutics raises a critical voice against neuroethical proposals that aim to reduce the normative character of ethics to socially agreed norms. The normative force of ethics transcends the parameters of social conventions, arises as a regulatory instance and offers an argumentative framework that transcends the particular interests of certain social groups.

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[Artículo aprobado para revisión en febrero de 2021]

²³ HABERMAS, J., «Das Sprachspiel verantwortlicher Urheberschaft und das Problem der Willensfreiheit. Wie läßt sich der epistemische Dualismus mit einem ontologischen Monismus versöhnen?», in *Philosophische Texte*, Band 5, chap. 9, Frankfurt, Suhrkamp, pp. 297-298.