

ERADICATING XENOPHOBIA AND APOROPHOBIA: COMPASSION AS A KEY CAPACITY OF MORAL NEUROEDUCATION

JAVIER GRACIA CALANDÍN

Universitat de València

ABSTRACT: Drawing on the contributions of some of the most recent and relevant studies on neuroethics and moral neuroeducation, this paper undertakes an analysis of compassion. In order to focus on the results of this neuroscientific research a reductionist naturalist framework is set aside in order to embrace the broader outlook of a moral neuroeducation that, firstly, refuses to reduce its normative character to the human capacity for evolutionary adaptation; and, secondly, seeks to locate within the brain the neuronal foundations for the development of a capacity for compassion towards those of one's own community, and also those from outside it. Thereby, this capacity for compassion moves beyond empathic tribalism.

KEY WORDS: Neuroethics; Moral Neuroeducation; Compassion; Empathy; Xenophobia; Aporophobia.

Erradicando la xenofobia y la aporofobia desde la compasión ética como capacidad clave de la neuroeducación moral

RESUMEN: Este trabajo recoge el aporte de algunos de los más recientes y destacados estudios sobre neuroética y neuroeducación moral para analizar la compasión. Se desecha una visión reduccionista naturalista y se aboga por enfocar los resultados de la investigación neurocientífica en el horizonte ampliado de una neuroeducación moral, que no solo no reduce el carácter normativo a la capacidad adaptativa pertrechada por la evolución sino que aspira a encontrar en el cerebro las bases neuronales que permitan desarrollar la capacidad compasiva hacia próximos y lejanos, más allá de tribalismos empáticos.

PALABRAS CLAVE: neuroética; neuroeducación moral; compasión; empatía; lacras sociales.

1. EDUCATION AS HUMANITY'S FUTURE

Numerous and diverse scenarios have been imagined for the future of humanity. There are an increasing number of authors who declare that the future will not be a strictly «human» one, but «transhuman» or «posthuman». A world in which technological advances and artificial intelligence will even come to substitute human beings. It is worth asking if in such a world there is a place for education, or whether it will be substituted by the design of sophisticated programmes enabling machines to act with greater precision and efficiency (Cornella, 2020).

Yet, given the current state of science and technology it is clear that these transhumanist prophecies and predictions are far from coming true. Nonetheless, the presence of technology in contemporary society has substantially modified learning methods and as a result it may be asked whether it is these new

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

technologies that should define the future of the learning brain. From drugs that can stimulate our cognitive capacity to the use of electrostimulation methods, and on to the possibility of genetic modification, neuroscience is studying how to improve the brain's capacity for learning.

It is important to bear in mind that the human brain is a learning brain and it develops over the course of a lifetime. Across all neuroscientific studies, there is a unanimous agreement that the human brain—in contrast to other species—is characterized by its immense plasticity. It is this which allows the brain not only to be shaped, but also moulded in response to its environment. Thereby, its structures and functions may be transformed through the education it receives. Education would not be possible if we did not have a sufficiently complex and evolutionarily developed brain. Thanks to the highly developed nature of the cerebral cortex the brain can undertake executive functions, use language, make calculations, predict outcomes... It is thanks to the brain's plasticity that education plays a role of the utmost importance so that people are able to develop their full potential.

2. CIVIC ETHICS AS THE FOUNDATION OF NEUROEDUCATION

As a result of their extraordinary cerebral development, human beings have attained a capacity for moral judgements. And this has become established as one of the defining elements of human conduct. There are many moral codes that have arisen from the wide variety of human societies and cultures, whereby from an evolutionary point of view it may be affirmed that human beings are equipped with a moral capacity (Ayala and Cela Conde, 2018).

Human beings have come to be what they are through biological evolution, but also through education! Phylogenetically, morality may be studied; however, it would be reductionist to claim that the learning brain's development, both functionally and structurally, was limited to merely evolutionary factors or to environmental adaptation. In societies indelibly marked by moral norms, values and principles it is nothing less than the education undertaken at the very heart of those societies that enables people to develop individual characters. However, even individuals and human groups that live together in the same natural environments develop different customs and diverse codes of moral conduct. This is due to the key constitutive role that culture and education play in human societies.

While evolutionary biological studies only explains a part of the learning brain's evolution, they are undoubtedly of great value in order to comprehend the way in which we learn as individuals, for example; the importance of having an affective bond with what is learnt; the way in which knowledge is humanly attained; and how that knowledge is then consolidated. Educational neuroscience allows us to explore all these characteristics and even explain in evolutionary terms certain disorders linked to the learning of mathematics and reading (Howard-Jones, 2018).

Nonetheless, the study of the evolutionary foundations of the learning brain is just one facet of the broader question regarding the role of neuroeducation, and it fails to address the fundamental contribution made by civic ethics. Thereby, an aspect that ought not to be neglected is the type of ethical concept that shapes both education and the specific culture it contributes to; while biological evolution has been moulding the brain of human beings as a species and indeed the brain continues to exist in its evolved form, education is also capable of modifying the brain. To educate is to change the brain, which is not sealed after birth or at a certain age; instead the brain continues to shape itself, mould itself and transform itself functionally and structurally over the course of a person's lifetime. From the biological point of view, which is neither reductionist nor determinist, it may be stated that human beings, despite having their specific biological conditions, have the capacity to guide their own evolution and are able to develop their own freedom (Marina, 2012; Fuster, 2013; Gracia and Gozávez, 2019).

In contrast to a reductionist perspective that falls prey to the naturalist fallacy of believing that the ends of biological evolution are the ends to be pursued by morality (Cela-Conde and Ayala, 2018), moral neuroeducation argues that civic ethics provide the foundation for all humanizing education (Conill, 2019a; Conill, 2019b). Behavioural models are not measured in terms of the environmental adaptation achieved, or to what extent individual or group survival skills are optimized, but instead on the basis of a way of life founded on humanizing values, a way of life that transcends exclusive (and excluding) tribal interests.

It is worth recalling that in virtue of a «humanistic approach» it is possible to understand education as an eminently humanizing task (UNESCO, 2015; ONU, 1948: article 26). It is only through fundamental ethical values and principles that it is possible for human beings to fully develop their character and personality. In short, some of the main values of this concept of civic ethics are the empowerment of people's meaningful freedom; fostering a sense of responsibility based on conviction and a sense of conviction that is wholly responsible; dignity as an egalitarian value complemented by the value of an enriching concept of identity founded on difference; and finally, the value of solidarity with the most disadvantaged as an active mode of respect and a proactive mode of tolerance that enables humanity as a whole to live together peacefully, to engage in dialogue and to understand and mutually recognize one another's human values. All these values can essentially be encapsulated through the consolidation of the value of justice, and humanity's quest for complete personal development in a just, healthy and sustainable surroundings (Gracia, 2020).

If the ethical-civic foundation of the humanistic approach of education is neglected learning diverges into mere instruction, training or indoctrination. The aim of moral neuroeducation is by no means just about the survival of the individual or group at any price, irrespective of the prejudice this may cause towards other individuals or groups. Instead it is very much concerned with sinking down roots into our shared humanity, ones that transcend exclusive

group interests (Conill, 2019a; Gracia, 2019; Ortega, 2019). It is by no means concerned with forcefully imposing on others a type of belief or some specific doctrine, rather it above all aims to respect and foster human freedom, and this is precisely why education should not be confused with indoctrination. Yet it should not be confused with training or mere instruction, because a person is only capable of fully developing their character when guided by the light of moral values and rules. What distinguishes the substantial difference between education and machine learning is the capacity for «preference», and therefore of «ascribing value», as well as recognizing a world of values directly linked to the intrinsically human way of feeling and reasoning.

3. ERADICATING THE HUMAN BRAIN'S XENOPHOBIC AND APOROPHOBIC TENDENCY THROUGH ETHICAL-CIVIC NEUROEDUCATION

Neuroscientific studies inform us that the human brain has a natural tendency towards xenophobia. Just like with other animal species, in human societies the behavioural codes selected for evolution favour internal group solidarity, mutual assistance, social cohesion, as well as the emotions that lead to racial prejudice and the rejection of strangers. In primitive societies emotions such as a fear of strangers serve to detect differences that might indicate danger. It is these behavioural codes from hunter gatherer societies, selected through evolution, that have been incorporated into the brain and form a kind of natural tendency (Damasio, 2011; Churchland, 2011; Cortina, 2011; Greene, 2013; Eagleman, 2013, Evers, 2015). Indeed, Charles Darwin in *The Descent of Man* highlighted how a tribe that displayed a greater degree of patriotism and internal cohesion while protecting the members of its own group, will be more successful than other tribes and in the long term this will favour natural selection (Darwin, 2009: 171-172).

From an evolutionary point of view, the brain's xenophobic tendency is natural and it is of evolutionary value for the survival for the group. However, from the humanist focus of civic ethics, which extends its moral horizon to encompass humanity as a whole, this type of conduct is deficient and generates social exclusion. Feelings, attitudes and actions that are derived from the brain's xenophobic tendency cannot serve as a model for social relations. Therefore, it is of the utmost importance to stress how tribal moral codes selected through evolution do not establish ethical criteria to guide our contemporary societies. On the other hand, through education and more specifically an ethical-civic education founded on the values of freedom and respect for the human dignity of all (as well as all the other values indicated above) it is possible to configure a society that overcomes the xenophobic trends of our brain. The brain's plasticity means that through education the group trends that underpin xenophobic prejudice and feelings can be corrected.

However, consideration must also be given to the point made by a great many neuroscientists, which is that the brain is not only xenophobic. It also contains

aporophobic tendencies (rejection of the poor); or in other words, evolution also favours the rejection of those who are in disadvantaged situations either because they perturb individuals' lives and well-being, or else because they may cause problems. Not only are strangers (*xénos*, in the original Greek) rejected, but rejection is also imposed on those individuals who lack the necessary means, the poor (*áporos*, in the original Greek) who thereby are excluded from social exchange (Cortina, 2017). The drama of poverty in all its forms is that of society's exclusion of the most vulnerable, and its refusal to recognize them as human beings. The rejection of the poor is a blemish on human society and its eradication through education is a priority.

Xenophobia and aporophobia are natural tendencies, resources that evolution has incorporated into our brain during the struggle for survival. However, bearing in mind the brain's plasticity and the educational outlook of civic ethics, which is defined by its unequivocal defence of the dignity of all human being, the tribalism of primitive societies is today inadmissible. Through education all means must be deployed to overcome the social blemishes of the hatred of the foreigner and the rejection of the poor. Faced by war and aggressive forms of nationalism which exclude all kinds of people, moral neuroeducation must endeavour to establish a culture of encounter and dialogue.

In the framework of an intercultural and cosmopolitan education, it is essential that greater emphasis be placed on the virtue of hospitality (Cortina and Conill, 2016). Hospitality towards the stranger and hospitality to the poor. In today's international context marked by the refugee crisis, democracy is suffering a downturn, inequality is growing, and thereby hospitality is not only a question of being charitable, but instead a human right and duty that must be fostered through education. It is essential that solidarity with the most unfortunate is developed into educational programmes that are intended to train critical and compassionate citizens, who are capable of taking a critical stance in the face of injustice while engaging with the perspective of those that suffer; and above of all being capable to commit themselves to those in need. Therefore, it is essential «to educate critical but also compassionate people» (Gracia, 2020).

To achieve the ethical-civic aim proposed here it is of the utmost importance to identify the key insights provided by neuroscience as this can help explain how xenophobia and aporophobia can be eradicated. For this purpose, I will now turn to examine the analysis undertaken with the field of neuroscience on the human capacity for compassion.

4. ETHICAL COMPASSION AS A KEY CAPACITY OF MORAL NEUROEDUCATION

One of the principal achievements of neuroscience in general and of neuroethics and neuroeducation in particular has been to place a greater emphasis on the emotions as key elements that explain people's behaviour and educational activity. It has been known for some time that reason operates

through emotions in a range of ways, but recent neuroscientific studies provide a much more precise explanation of how cerebral mechanisms underpin the different emotions. To undertake an analysis of the capacity for compassion I will return to a series of key conceptual distinctions and develop them within the framework of a moral neuroeducation that enables the eradication of social blemishes such as xenophobia and aporophobia.

The first distinction that must be drawn is between compassion and empathy. On occasions they can be confused, so to ensure greater clarity they must be distinguished from one another and, furthermore, situations need to be identified in which neither empathy nor compassion play a role, but instead it is emotional contagion or simply what may be termed pitiful lament that is present. In addition, compassion is often confused with a feeling of pity which deep down feeds back into sensations with antisocial effects because it is incapable of being moved (or stimulating its own action) *with and for* the other, namely, it is incapable of acting with the other and for the good of the other.

Only true compassion, that which makes its home in an ethically vigorous heart, is that which, through the development of caring and attentive forms of behaviour, is disposed to share suffering to the very limit of its strength and act with and in favour of the other. Such compassion has a positive valency from the point of view of the subject's psychological health because it does not double back on itself, nor flee from the situation; instead it substitutes a vain grimace of pity with undertaking a necessary course of action. However, it has to be added that true compassion is not based solely on its psychological valency, but also on its ethical validity for moral neuroeducation. Attention must now be turned to the neuroscientific analysis of these emotions.

4.1. *True compassion in contrast to emphatic distress in neuroscientific studies*

The term «empathy» (*Einfühlung* in German) has gained increasing currency in a range of senses since the start of the twentieth century. At the outset of *The Social Neuroscience of Empathy*, Batson (2009) distinguishes between at least 8 concepts of empathy and alludes to the importance of the imagination, as well as what some eighteenth-century philosophers such as David Hume and Adam Smith called «sympathy», and also what psychologists working in the late twentieth century, such as Elaine Hatfield, John Cacioppo and Richard Rapson, have termed «emotional contagion». It is only the eighth and last of the senses of empathy defined by Batson that is explicitly linked to compassion. In the final analysis, although diverse modes of empathy may be identified, the key issue that permits a clear distinction to be drawn between empathy and compassion, is whether the motivation to eliminate the suffering of others arises from the self-interest of not suffering oneself (eliminating empathic distress), or out of a concern to alleviate suffering for the good of the other (compassion for the other).

In order to refine the distinction between empathy and compassion, empathy could be defined as the capacity to share the feelings of others, or in other words, feel «within» oneself (*em-patheia*; *Ein-fühlung*; *feeling into*)

what another person is feeling, but without necessarily confusing one's own feelings with those of the other. However, on occasions the emotional bond can be so strong or one's own identity and capacity to discern one's own feelings so weak that a person ends up effacing the distinction between themselves and the other. Such an eventuality is referred to as emotional contagion. Emphatic distress is a type of emotional contagion that results from adopting the pain of the other, and it is this aspect of empathy that must be considered in order to clearly distinguish it from compassion. Compassion, it is not merely concerned with feeling *with* the other, but rather *for* the other with the intention, guided by a pro-social motivation, to improve their situation. It is in response to this issue that Singer and Klimecki's (2014) neuroscientific analysis proposes that compassion provides an alternative and healthy response to emphatic distress.

While empathy refers to our general capacity to resonate with others' emotional states irrespective of their valence —positive or negative— empathic distress refers to a strong aversive and self-oriented response to the suffering of others, accompanied by the desire to withdraw from a situation in order to protect oneself from excessive negative feelings. Compassion, on the other hand, is conceived as a feeling of concern for another person's suffering which is accompanied by the motivation to help. By consequence, it is associated with approach (Singer and Klimecki, 2014: 875).

While such distinctions are well established in the traditional field of social psychology, one of the principal contributions made by Singer and Klimecki (2014) and Klimecki et al. (2013 and 2014) within the field of neuroscience is based on having identified how different cerebral mechanisms are activated in the neuronal network depending on whether a response employs the capacity for empathy or compassion. In the case of the capacity for empathy, it has been demonstrated that the same cerebral mechanisms are activated whether a response is made to one's own pain or that of another person (in the case of pain it is the *anterior insula* and *anterior cingulate cortex* are activated). Therefore, the emphatic capacity shares the same structures and neuronal routes as the feelings generated by first-hand experiences.

Secondly, it has to be underscored that both empathy and compassion can be annulled by diverse factors such as, on the one hand, alexithymia (the inability to identify one's own emotions, as occurs for example with autism) or, on the other hand, by the joy derived from the suffering of the other (*Schadenfreude*, in German). However, a fundamental issue that must be underscored is that there are a number of decisive factors that modulate empathy and compassion, and these are linked to an individual's perceptions of belonging to a group, and also their sense of justice. As a result, this powerful emphatic link towards members of one's group can lead to the rejection of and lack of empathy towards members of other groups. We will return to this point below.

The third, and from my point of view, the principal contribution made by Tania Singer's research group has been the analysis of the plasticity of the neuronal networks of both empathy and compassion, which is based on the results of a

range of training programmes. Singer's studies demonstrate, firstly, how after several days of emphatic training visualizing the pain of others the participants reported an increase in the negative affects of the emphatic distress, and this was accompanied by an increased activation of the insula and anterior middle cingulate cortex. On the other hand, a subsequent training exercise on the same subjects, but this time focused on their capacity for compassion using meditation, mindfulness and dyadic techniques led to a reduction in the negative effects (emphatic distress) and a corresponding rise in the positive valency of affects towards the pain of others (compassion); these are associated with the activation of a distinctive cerebral network to that of the empathy, one that is associated with processes of affiliation and reward and is located in the medial orbitofrontal cortex (mOFC), the ventral striatum (VS), the ventral tegmental area (VTA), and the subgenual anterior cingulate (sgACC) (Engen and Singer, 2015).

Admittedly, it may be argued that there is a certain behaviourist slant to the type of training used in these experiments and it might also be questioned whether in three months it is possible to obtain genuinely lasting results that lead to significant changes in people's character (*êthos*). However, it may be stated that these experiments were undertaken on a very significant number of participants (around three hundred), and what is of special interest is that they demonstrated, firstly, the considerable plasticity of the capacity for compassion, and secondly, the importance of ethical-educational factors for distinguishing compassion from an unhealthy form empathy. In addition, as will now be shown compassion must be distinguished from negative effects that would arise from dissociating of emotional processes from cognitive ones.

4.2. *Overcoming the disassociation of cognition and emotion through compassion*

The neuroscientific studies on empathy such as that undertaken by Kanske et al. (2015) trace an important difference between the socio-affective route of empathy and the socio-cognitive route of the *Theory of Mind (ToM)*. Both routes, with their distinctive neuronal circuits, may be clearly differentiated and while the former alludes to the capacity to feel the pain of the other as one's own and activates all the regions indicated in the previous section, the second is focused on the capacity to adopt the viewpoint of the other in cognitive terms, but without activating the processes of sharing feelings. The *Theory of Mind (ToM)* route is concerned with abstract and propositional knowledge about the mental state of the other and it involves the cerebral regions of the ventral temporoparietal junction (TPJ), superior temporal sulcus (STS), temporal poles (TP), medial prefrontal cortex (MPFC) and precuneus/posterior cingulate (PCC) (Schurz et al., 2014).

Case studies that demonstrate the dissociation of both processes are detected in psychopathologies such as psychopathy, on the one hand, and autism, on the other. Psychopaths who are aggressive offenders can be shown to be proficient in terms of *ToM*, which is because they are capable of adopting a cognitive perspective on the situation of others, and are able to understand the thoughts and intentions of others, as well as what is needed by the person

who suffers. However, they are nonetheless devoid of empathy and still more so of compassion. They use their capacity to understand the situation of other people in cold, calculating terms, and, definitively, to manipulate and inflict more suffering (Winter et al. 2017). Another psychopathology, autism, presents a dissociation between both processes, but in a contrary manner. In the case of autism individuals are deficient in ToM, but there are no observable deficits in empathy when control is exerted over alexithymia (Bird and Viding, 2014).

The socio-affective route (*empathy*) and the socio-cognitive (*ToM*) routes are two processes that are based on independent neuronal networks. However, that does not imply that it is not necessary to overcome their dissociation and that they be mutually connected in order to overcome complex social situations. Preckel et al. (2018) have stressed precisely this need to combine both processes in order to achieve a socio-adaptive behaviour (known as *Empa-ToM*). These authors highlight how there are diverse and complex social situations in which empathy and ToM are combined activities, such as for example undertaking complex evaluations of the feelings of others, or the still more renowned case of making self-other distinctions. «The activation of SMG [supramarginal gyrus] and TPJ [tempoparietal junction] in complex empathy and ToM paradigms, respectively, corresponds with the crucial role of self-other distinction for both capacities» (Preckel et al., 2018: 4).

Both systems are activated in conjunction in order to achieve a better understanding of the mental and affective states of others. Although the measurement of ToM and empathy are independent tasks when it comes to carrying out prosocial behaviour, both are necessary. And this is especially important for clearly discerning true compassion because as we have pointed out above, in the case of sharing pain empathy can degenerate into emphatic distress and result in antisocial effects of frustration and anger, such as verbally aggressive behaviour. In contrast, compassion is capable of understanding the pain of others, but not in order to relive it as a form of distress, but rather to activate the neuronal system linked to affects that generate the prosocial forms of behaviour of assistance and care. To achieve this compassion is enhanced when cognitive strategies for emotional regulation, such as *cognitive reappraisal*, are activated at the same time and in parallel to the capacity of compassion, and this leads to a reduction in negative affects that could give rise to emphatic distress. The deactivation of the antisocial affects of emphatic distress through cognitive reappraisal, on the one hand, and the activation of the neuronal system of compassion associated with prosocial affects, on the other, work in conjunction to favour an increased development of the capacity for empathy (Engen and Singer, 2015).

4.3. *The genuine ethical dimension of hospitable compassion. Moral neuroeducation beyond emphatic groupism*

Having highlighted how recent neuroscientific research has contributed to elucidating compassion with greater precision and distinguishing it from both

empathy and the cognitive capacity of comprehending mental states (ToM), closer scrutiny must now be paid to two factors indicated above, which were only addressed in passing: the sense of belonging to a group and the sense of justice. These two aspects are crucial for both the development of the capacity for compassion, and to develop the aim of moral neuroeducation in an appropriate manner, as was addressed in the neuroscientific research discussed above.

Belonging to a group can effectively be a necessary factor for group cohesion, as well as making living together in the same space viable. However, neuroscientific research clearly demonstrates how empathy towards members of the same group, can give rise to seemingly hidden antipathies, rejections and phobias towards members of different groups. In fact, one of the elements that can on occasions prove to be most cohesive in a group is the identification of a common enemy belonging to a rival group. This form of cohesive empathy is very close to emotional contagion, and on occasions it effectively ends up annulling self-other distinctions while blurring and effacing individuality into a phagocytic collective that imposes uniformity (as is the case in aggressive forms of nationalism and totalitarianism). Furthermore, in terms of ethics the cost of this form of empathy is too great. The reason for this is because empathy towards one's own group conceals the rejection and even phobia of other different groups. I would go so far as to say that this type of empathy is «anti-ethical».

In contrast to anti-ethical empathy, the genuine ethical dimension of compassion is essentially hospitable, because it is not concerned with reinforcing the bonds of the group at all cost, and still less so with generating social exclusion and the rejection of the most disadvantaged, those that lack resources, the poor. Hospitable compassion moves beyond the narrow margins of a capacity for compassion enclosed within the limits of an individual's own group. Instead it is projected outwards towards all humankind. The capacity for compassion as a genuinely ethical capacity, one marked by the (ethical) sense of justice, not only attends to the evolutionary performance of the group dynamic, but is also capable of generating a cognitive reevaluation of emotions themselves and integrating beliefs and ideas regarding justice in order to mould human character (*êthos*). The emotions that generate the system of compassion are activated in conjunction with the feeling of justice, which is in turn based on favouring the most disadvantaged (even though they do not belong to the group itself). It is important to bear in mind that the ideas regarding this sense of justice are not disconnected from an affective dimension; indeed, it is these ideas that manage to activate the neuronal network and ascendant regulation of the affects linked to compassion.

It is this ethical or hospitable compassion that has to be developed through moral neuroeducation. Compassion raises the issue of ungovernable emotions, and it also engages with the affects that are defined by factors related to group membership and a sense of justice, whereby these form part of what can be educated. However, it is essential to have a sound knowledge of the plasticity of the capacity for compassion and also how ToM systems and compassion can work in conjunction with one another.

Finally, I would add that by addressing compassion within the framework of moral neuroeducation is not only a matter of delivering training for various months, instead it involves undertaking a more radical education of human character over the course of a lifetime. Mastering certain meditation techniques can be very beneficial, but it is not the specific aim of education, nor that of moral neuroeducation (Gracia, 2019). From the point of view of moral neuroeducation, compassion is not so much a technique as a mode of knowledge embedded in the affects and while it is clear that a knowledge of neuronal mechanisms helps attain a better grasp of this capacity, its moral foundation is not to be found in myopic group interests, but rather by upholding the principle of treating every human person (although they do not belong to an individual's own specific group) as an end and never as a means. It is this that must provide the imperative moral foundation of moral neuroeducation.

CONCLUSION

Compassion contains a valuable resource to eradicate the social blemishes of xenophobia and aporophobia. However, drawing on neuroscientific studies it has been concluded that compassion must be distinguished from both empathy and ToM. As has been demonstrated these three systems operate via independent neuronal processes located in different regions of the brain. We are now able to comprehend with great precision the plasticity of the human capacity for compassion as well as with the neuronal system associated with it, and this underscores the crucial importance of a sound education based on ethical values that foster care and attention towards others. It is essential that ethical compassion should not be confused with other modes of empathy, such as emphatic distress, or the understanding of mental states of others (ToM). Nor should it be mistaken with sympathy towards one's own social group, which as has been discussed conceals antipathies towards different groups. Having drawn these distinctions, it is of the utmost importance that ethical compassion is identified as the capacity needed to eradicate xenophobia and aporophobia. It is for this reason that for moral neuroeducation ethical compassion is a key and fundamental capacity.

BIBLIOGRAPHY

- Batson, C. D. (2009). These things called empathy: Eight related but distinct phenomena. In J. Decety & W. Ickes (Eds.), *Social neuroscience. The social neuroscience of empathy* (p. 3-15). MIT Press. <https://doi.org/10.7551/mitpress/9780262012973.003.0002>
- Bird, G., Viding, E. (2014). The self to other model of empathy: providing a new framework for understanding empathy impairments in psychopathy, autism, and alexithymia. *Neuroscience Biobehavioral Reviews*, 47:520-532.

- Cela Conde, C. J, y Ayala, F. (2018). *El cerebro moral. Evolución del cerebro y valores humanos*. EMSE EDAPP.
- Churchland, P. S. (2011). *Braintrust*. Princeton: Princeton University Press.
- Conill, J. (2019a). Must Ethics for Moral Neuroeducation Be Naturalistic? In: P. Calvo y J. Gracia, *Moral Neuroeducation for a Democratic and Pluralistic Society*. Zurich: Springer, pp. 3-18.
- Conill, J. (2019b). *Intimidad corporal y persona humana. De Nietzsche a Ortega y Zubiri*. Madrid: Tecnos.
- Cornella, A. (2020). *Educating for humans in a world of Smart machines. 100 ideas and thoughts about the new education our society needs*. Barcelona: Institute of Next.
- Cortina, A. (2011). *Neuroética y neuropolítica. Sugerencias para la educación moral*. Madrid: Tecnos.
- Cortina, A. (2017). *Aporofobia, el rechazo al pobre*. Barcelona: Paidós.
- Cortina, A. y Conill, J. (2016). «Ethics of Vulnerability», en: A. Masferrer y E. García-Sánchez (eds.), *Human Dignity of the Vulnerable in the Age of Rights. Interdisciplinary Perspective*. Cham: Springer, pp. 45-62.
- Damasio, A. (2011). *En busca de Spinoza. Neurobiología de la emoción y los sentimientos*. Barcelona: Destino.
- Darwin, Ch. (2009). *The descent of man, and selection in relation to sex*. Cambridge: Cambridge University Press.
- Eagleman, D. (2013). *Incógnito. Las vidas secretas del cerebro*. Barcelona: Anagrama.
- Engen H. G., Singer, T. (2015). Compassion-based emotion regulation up-regulates experienced positive affect and associated neural networks. *Social Cognitive and Affective Neuroscience*, 10:1291-1301.
- Evers, K. (2015). Can we be epigenetically proactive? T. Metzinger y J. M. Windt (eds.), *Open Mind*: 13 (T) Frankfurt am Main, Mind Group.
- Fuster, J. M. (2013). *The neuroscience of Freedom and Creativity*. Cambridge: Cambridge University Press.
- Gracia, J. (2020). *El desafío ético de la educación*. Madrid, Dykinson. 2nd Edition. Revised and expanded.
- Gracia, J. (2019). Non-naturalistic Neuroethics for Moral Neuroeducation. In: P. Calvo y J. Gracia, *Moral Neuroeducation for a Democratic and Pluralistic Society*, Zurich: Springer, pp. 19-34.
- Gracia, J. y Gozávez, V. (2019). La libertad incorporada como clave para la neuroeducación moral, *Sophia* 26, 59-82.
- Greene, J. (2013). *Moral tribes. Emotion, reason and the gap between us and them*. New York: Penguin Press.
- Howard-Jones, P. (2018). *Evolution of the learning brain. Or how you got to be so smart...*, Oxon, Routledge.
- Kanske, P., Böckler, A., Trautwein, F. M., Singer, T. (2015). Dissecting the social brain: introducing the EmpaToM to reveal distinct neural networks and brain-behavior relations for empathy and theory of mind. *Neuroimage*. 122:6-19.
- Klimecki, O. M, Leiberg, S., Lamm, C., Singer, T. (2013). Functional neural plasticity and associated changes in positive affect after compassion training. *Cereb Cortex*. 23:1552-1561. 13.
- Klimecki, O. M, Leiberg, S., Ricard, M., Singer, T. (2014). Differential pattern of functional brain plasticity after compassion and empathy training. *Social Cognitive Affective Neuroscience*, 9:873-879.
- Marina, J. A. (2012). El diálogo entre neurociencia y educación. Participación educativa. *Revista del Consejo Escolar de Estado* 1, 7-13.

- ONU (1948). *Declaración Universal de los Derechos Humanos*. <https://www.un.org/es/universal-declaration-human-rights/> (consultado 20 de junio de 2019).
- Ortega, C. (2019). Moral Neuroeducation, Ethics of Justice and Pluralism. In: P. Calvo y J. Gracia-Calandín, *Moral Neuroeducation for a Democratic and Pluralistic Society*. Zurich: Springer, pp. 45-58.
- Preckel, K., Kanske, P., Singer, T. (2018). On the interaction of social affect and cognition: empathy, compassion and theory of mind. *Current Opinion in Behavioral Sciences*, vol. 19, 1-6. doi.org/10.1016/j.cobeha.2017.07.010
- Singer, T. and Klimecki, O. M. (2014). Empathy and Compassion. *Current Biology*, 24, 18, Current Biology, doi.org/10.1016/j.cub.2014.06.054
- Schurz, M., Radua, J., Aichhorn, M., Richlan, F., Perner, J. (2014). Fractionating theory of mind: a meta-analysis of functional brain imaging studies. *Neuroscience Biobehavioral Reviews*, 42:9-34.
- UNESCO (2015). *Replantear la educación. ¿Hacia un bien común mundial?* París: Unesco.
- Winter, K., Spengler, S., Bermpohl, F., Singer, T., Kanske, P. (2017). Social cognition in aggressive offenders: impaired empathy, but intact theory of mind. *Scientific Reports*, 7. DOI: 10.1038/s41598-017-00745-0

Universitat de València
javier.gracia@uv.es

JAVIER GRACIA CALANDÍN

[Artículo aprobado para publicación en febrero de 2021]