

Preface - Vorwort

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What is What? Focus on Transdisciplinary Concepts and Terminology in Neuroaesthetics, Cognition and Poetics

Introduction

The birth of the new discipline “neuroaesthetics” (Zeki, 1993, 2008, 2014) and more in general the “biocultural turn” (Wojciehowski & Gallese, 2011, 2018; Cometa, 2018; Gambino & Pulvirenti, 2018; Uboldi, 2018; Gallese 2018) have put at the core of the recent transformation of the epistemological paradigms the linkage among literary studies, neuroaesthetics, anthropology, philosophy, linguistics, poetics, art history, psychology, and the most recent cognitive and neuroscientific studies. This new transdisciplinary venture overcoming the dichotomy between culture and nature has highlighted how we can better understand the artistic creation by relating it to the cognitive brain processes underpinning any human activity. In this perspective, culture is to be intended as an extension of the human mind and bodily nature and as a process of cognitive technological development (Gallese, 2017). This transdisciplinary approach, although criticized as expression of reductionism and interference between science and human studies, has shed new light on many relevant issues with regard to both artistic questions and brain–body processes such as empathy, emotions, consciousness, imagination, vision, perception and narration, in the frame of a new concept of cognition: in opposition to the computational model of the first generation, the nature of mind is now considered by cognitive sciences as embodied, embedded, enactive and extended, giving rise to the concept of “4E cognition”, with regard to the coupling of brain, body, action and environment (Newen, de Bruin & Gallagher, 2018). Consequently, this issue aims at providing a series of terms used in the last generation of cognitive studies and of examples of how the new approach to cognition is opening new routes to interpret the most surprising product of human mind: art.

The relationship between art and human mind is ancient and has developed over millennia; however, it is also modern and has not ceased developing. It is central to every new topic in aesthetic, as well as in philosophical, anthropological and cultural discourse. Above all, art deals with human nature – it is a window and

a mirror into the self and its relationship with the world – of what it is, what it was and what it could be. This issue is therefore central to all discussions about the processes of perception, cognition and memory, because art and literary texts have an especially privileged position in mirroring the linkage between the self and the world, providing a fundamental space for reflecting on the cognitive processes as source of imaginative representation in a transdisciplinary perspective.

The transdisciplinary discourse (Pohl & Hirsch, 2008) which has been put at the core of the research agenda since 1970 (Bernstein, 2015) aims at developing a normative, descriptive and practice-oriented knowledge. Effective and promising transdisciplinary research requires a new knowledge, which cannot be acquired without collaborations among researchers of different disciplines. Human scholars cannot become experts of brain processes, and neuroscientists cannot be art historians, but out of their dialogue and collaboration new perspectives and answers have been born. For this aim, a shared knowledge is necessary to develop a dialogue in order to posit together in transdisciplinary teams new questions and a new way of inquiring old questions. This shared knowledge is difficult to be accomplished and requires a lot of engagement, study, curiosity and self-challenge. It also requires a shared vocabulary, since many terms and concepts are used in different disciplines with different meanings. Scholars of hard and human sciences are faced with heuristic differences arising from the usage of terms differently intended in each field of research, such as empathy, immersion, and so on. Sometimes, the lack of a common language creates incomprehension, misunderstandings and, above all, confusion. Different works and studies propose new terms and categories to set the possible frame for future research. However, there is still confusion on what should be used and in which case. One of the main limits and problems in transdisciplinary research is given by the fuzziness of the terminology and of the definitions each researcher refers to. For this reason, we think that it is necessary to reflect on some terms, concepts and categories that are fundamental in drawing different disciplines to the study of artistic and literary texts as fundamental issues to understand the human mind processes, both in the creative and in the receptive phase. This is mainly needed to clarify the uncertainties and differences in terminology that have emerged over the last years and to push the neurocognitive and humanities dialogue further.

Keeping Mark Turner's pioneer project in mind, the web portal "An Atlas for Research in Cognition and Poetics", we propose in this issue to carry out a preliminary work giving account of some basic terms and concepts in a transdisciplinary perspective. This in order to set some clear pillars of the huge and growing discourse about the arts and the mind/body reception and production processes that will probably involve the humanities, the neuro- and cognitive sciences in the coming years.

This new challenge is also the output of the last 5 years of NeuroHumanities Dialogues organized by the Neurocognitive and Humanities Research Centre and the Neurohumanities Studies Network (www.neurohumanitiestudies.eu), which have promoted a prolific interdisciplinary discussion among different international research groups on several topics, such as neuroaesthetics, metaphors, cognition and imagination. The NeuroHumanities Dialogues held in 2018 focused on the terminological difficulties encountered during transdisciplinary research studies.

The results of this 5-year work are gathered in this issue with the title *What is What? Focus on Transdisciplinary Concepts and Terminology in Neuroaesthetics, Cognition and Poetics*. Its aim is to create a useful tool for the new generation of young researchers and also to set a clear framework concerning the state of the art in the definition of some groundbreaking terms regarding the new frontiers in the research that inquires arts and poetics as responding to mind/body processes.

In the opening article, *Notes Towards a (Neurobiological) Definition of Beauty*, neurologist Zeki, founder of neuroaesthetics, inquires about one of the fundamental concept for both the human and the neuroscientific studies: Beauty. Without forgetting the philosophical and aesthetic discourse about this concept, Zeki proposes a new perspective about this indefinable concept, which regards beauty in neurobiological terms, setting it as an experience correlating with the activity in a specific part of the emotional brain, namely field A1 of the medial orbitofrontal cortex (A1mOFC). Zeki has conducted many experiments, he refers some of which in this article, inquiring different sources of beauty, which are well correlated with activity in the same brain area with quantitative differences, giving rise to further fascinating questions to be investigated in the future.

The idea of neural correlates generally refers also to the concept of embodiment and, particularly by studying the reception of art and literature, to that of “embodied simulation” which is clearly defined by Vittorio Gallese in his article *Embodied Simulation. Its bearing on aesthetic experience and the dialogue between neuroscience and the humanities*. Gallese defines “embodied simulation” as the process which gives account of interpersonality and intersubjectivity, shedding new light on the aesthetic experience in relation to sensations, empathy and emotions. The neuroscientist explains the concept and discusses its heuristics in the transdisciplinary dialogue between neuroscience and humanities, drawing an evolutionary frame and highlighting the connection of the art producer with that of their recipients. The author sketches the evidences obtained with regard to the concept of embodied simulation as the expression of the functional neural mirror system, which implies our ability to share emotions and sensations with others, recruiting the same visceromotor and sensory-motor brain areas activated when experiencing the same emotions and sensations. In aesthetic and fictional experiences,

as well as in the act of imagining, the embodied simulation lets us feel for and empathizes with images and characters as if they were part of the real world. This perspective changes radically our way of regarding the aesthetic experience and the literary's production and reception shedding light on the central role played by the sensory-motor engagement of our body.

The paper sums up many experiments conducted to investigate the neural and bodily processes involved in the aesthetic experience of literature, fine arts and film, demonstrating the advantages of a neuroscientific investigation of issues and topics of the humanities. Finally, the author takes part for a new vision of any human cognitive technology (cultural artefacts) as expression of the human mind and bodily nature in a new biocultural perspective which overcomes the big divide between nature and culture.

The concept of embodiment is a relevant issue in every artistic expression and particularly in theatre. This topic is highlighted by Amy Cook in her essay *Cognitive contagion: thinking with and through theatre*, where she reflects on the importance of embodiment in the theatre, with particular attention to the role of spectators. Cook introduces the audience as a group of embodied minds who become a singular subject reacting as one, since they share the same experience at the same time. The contribution also examines the cognitive work of theatrical productions that stage the audience differently, such as Pan Pan's *The Rehearsal: Playing the Dane*, in which spectators are asked to physically act on stage along with actors instead of being cast as passive observers. In this perspective, the audience acts as a unitary group which is able to create a shared temporary meaning. Furthermore, this kind of production aims to trigger feelings and emotions through the involvement of the body, which becomes a privileged cognitive means to take part in the representation. In this sense, Cook affirms that making sense of theatre is a full-bodied affair.

In order to better comprehend how feelings and emotions expressed by the body and the language can be shared, it is necessary to introduce the still fuzzy concept of "empathy", which implies a broad spectrum of issues covering a set of categorical relationships exploited in different contexts. There are, in fact, different interpretations of the term, some denying the utility of a precise notion to define the process of deeply understanding the experiences of others, while some others claim that nothing, accountable and definable of such a complex human experience, can be represented in a single term, which is often taken for granted and considered as self-evident.

This controversy has produced an amount of different interpretations and umbrella terms, as Pinotti and Salgaro put in evidence, so that the term has become a problem within empirical studies as well as controversial in qualitative research.

A precise and clear account of the term's history, of its diverse interpretations and of the related problems, prevents from agreeing on a crystal clear definition. As a result, the solution proposed in this paper is not the traditional one, where authority signs the lines and limits, but that of "attunement" among the members of a research community.

In addition, the principle of "attunement" between the actors and the audience is probably leading the kind of empathy spontaneously at work in theatre. With regard to the biological basis of emotional involvement, Elisabetta Vinci's contribution *Empathy in Modern Drama: Bertold Brecht's Threepenny* establishes a comparison between the Brechtian theory concerning the *Verfremdungseffekte* and their practical inefficacy in suspending empathic responses by the audience. The inquiry of the *Threepenny Opera* tries to demonstrate how recent studies contradict the very premises of the Brechtian theory as far as empathy is concerned. Thanks to the study of theatrical production from a neurocognitive perspective, Vinci argues that the absence of empathy and immersion theorized by Brecht is impossible to be achieved on stage, because staging itself is based on biologically shared mechanisms that involve bodily and emotional transportation. This shared mechanism is active during each rehearsal, every time in a slightly different way. The creative power, which resides in a literary text or in a work of art, seems to boost the possibilities of triggering empathy and a sense of community. Therefore, the power attributed to creativity has become a very important term for recent research, both in the humanities and in the neurocognitive field. Despite its centrality, it is still a very fuzzy concept, that of creativity: it is a fairly recent one in biological terms, since it is not much older than a 1000 years. And yet, this term is now both widespread and probably for reason of a two broad use it is ill-defined.

In its contribution *What, if anything, is linguistic creativity?*, linguist Alexander Bergs inquires about the different meanings attributed to this term starting from a linguistic point of view. He carries out a review of its possible meanings, such as the realization of something new, valuable, worthwhile; the combination of hitherto unconnected elements; the creation out of nothing, *ex nihilo*. He focuses its interpretation of this concept on how language may be creative both in everyday and in poetic language, starting from Chomsky's generative principles and then drawing a difference among two main forms of linguistic creativity, F-creativity and E-creativity: F stands for "fixed", i.e. linguistic productivity, and E-creativity for "enlarging" or "extending", according to Sampson (2016). After dealing with examples of these forms, from three different domains, snow cloning, mismatch/coercion and aberration, he ends up overcoming this dichotomy between F-creativity and E-creativity and pointing out a continuum between these two poles. Bergs claims that pure E-creativity may only be found in the case of aberration

and that both snow cloning and mismatch/coercion are examples for F-creativity, but to varying degrees.

The idea of inquiring the literary text as a fluid dynamic device and not as a stable construction of parts is the focus of Renata Gambino's and Grazia Pulvirenti's paper. They promote a neurohermeneutic approach to literature linking literary criticism to cognitive studies: Neurohermeneutic overcomes the divide among text-immanent criticism, reader-response theory and literary anthropology. By bridging literary, cognitive and neuroscientific studies, the neurohermeneutic approach focuses on the relationship between the mind/brain processes, mirrored in the formal features of the text, and the strategies activated by the author in a text in order to guide the reader in imagining, emotionally feeling and cognitively getting meanings out of the literary experience. The aim of the neurohermeneutic approach is to describe the mirroring process between the two extremes of the literary experience, i.e. the writer's creative process as it is mirrored in the literary work and the reader's imaginative reconfiguration of the text, as well as what they share in common.

A wide field of empirical research is that devoted to the reading processes and the phenomenon of "immersion" during the act of reading. The results of these researches allow to consider literature as an immersive practice, able to expand our vital experience in a very concrete, daily way. This topic is at the centre of Pierre-Louis Patoine contribution *Representation and immersion. Towards an un-productive style of interpretation*, which clarifies the meaning of this term putting it in relation to the concept of representation within an interdisciplinary study, thus by combining neuroscience, literary studies and philosophy. Putting the phenomenon of immersion in relation to the concept of embodied simulation, Patoine considers immersion as a profound engagement with the artistic representation, generating a specific type of mental representation able to refresh the "normal" circuitry of neuronal representations, thus "opening up the doors of perception" to reuse William Blake's famous phrase.

Mental images, imagery, are the main focus of many researches in different disciplines since ancient time. Therefore, interrelating specific knowledge gained in different research fields has become a need today in order to gain new ways to get insight into such complex mind processes. This is what Benito Garcia Valero tries to do by reflecting on Gilbert Durand's theories about the *imaginaire*, putting them in relation to the recent cognitivist's theories developed by Mark Johnson. Durand's analysis of symbolism bases on the position of the body and the role of perception in determining the underlying schemata of symbols. Two decades later, Mark Johnson puts forward the cognitive theory of image schemata as structures at the base of language production relying on an internal structure derived from bodily perceptions. Due to their fundamental similarities, the

anthropological regime of the *imaginaire* described by Durand and the cognitive approach to language production proposed by Johnson reveal the core role of images and imagination in language production and also in the formation of anthropologically relevant symbols.

This issue does not pretend to be exhaustive in explaining the very complex phenomena of the mind–body system that humans have developed in relation to art and literature, but it hopes to put forward some clues of recent research in this field and to point out the immense potential and relevance of transdisciplinary work. Collaboration among different research methodologies and approaches is, in our opinion, the only way to interpret and get insight about the immense complexity of the human mind.

References

- Bernstein, J. H. (2015). Transdisciplinarity: A review of its origins, development, and current issues. *Journal of Research Practice*, 11(1). Available from: <http://jrp.icaap.org/index.php/jrp/article/view/510/412>
- Cometa, M. (2018). *Perchè le storie ci aiutano a vivere. La letteratura Necessaria*. Milano: Raffaello Cortina Editore.
- Newen, A., de Bruin, L., & Gallagher, S. (2018). *The Oxford Handbook of 4E Cognition*, Oxford: OUP.
- Uboldi, S. (2018). *Neurobiologia della finzione*. Broni: Altravista Edizioni.
- Gallese, V. (2018). Naturalizing Aesthetic Experience The Role of (Liberated) Embodied Simulation. *Projections* 12 (2), 50–59.
- Gambino, R., & Pulvirenti, G. (2018). *Storie Menti Mondì. Approccio Neuroermeneutico alla Letteratura*. Milano-Udine: Mimesis.
- Pohl, Ch., & Hirsch, H.G., (2008). *Methodological challenges of transdisciplinarity research. Nature Sciences Sociétés*, 16(2), 111–121, doi: 10.1051/nss:2008035
- Sampson, G. (2016). Two ideas of Creativity. In: Martin Hinton (ed.) *Evidence, Experiment and Argument in Linguistics and Philosophy of Language*. Bern: Peter Lang.
- Wojciehowski, H. C., & Gallese, V. (2011). How stories make us feel. Toward an embodied narratology. *California Italian Studies*, 2(1).
- Wojciehowski, H. C., & Gallese, V. (2018). "Introduction." *Costellazioni: Rivista di lingue e letteratura*, 5, 9–22
- Zeki, S. (1993). *A Vision of the Brain*. Oxford/New York: OUP.
- Zeki, S. (2008). *Splendors and Miseries of the Brain: Love, Creativity, and the Quest for Human Happiness*. Chichester: Wiley-Blackwell.
- Zeki, S., Romaya, J.P., Benincasa, D.M.T., & Atiyah, M.F. (2014). The Experience of Mathematical Beauty and its Neural Correlates. *Frontiers in Human Neuroscience*, 8. doi: 10.3389/fnhum.2014.00068