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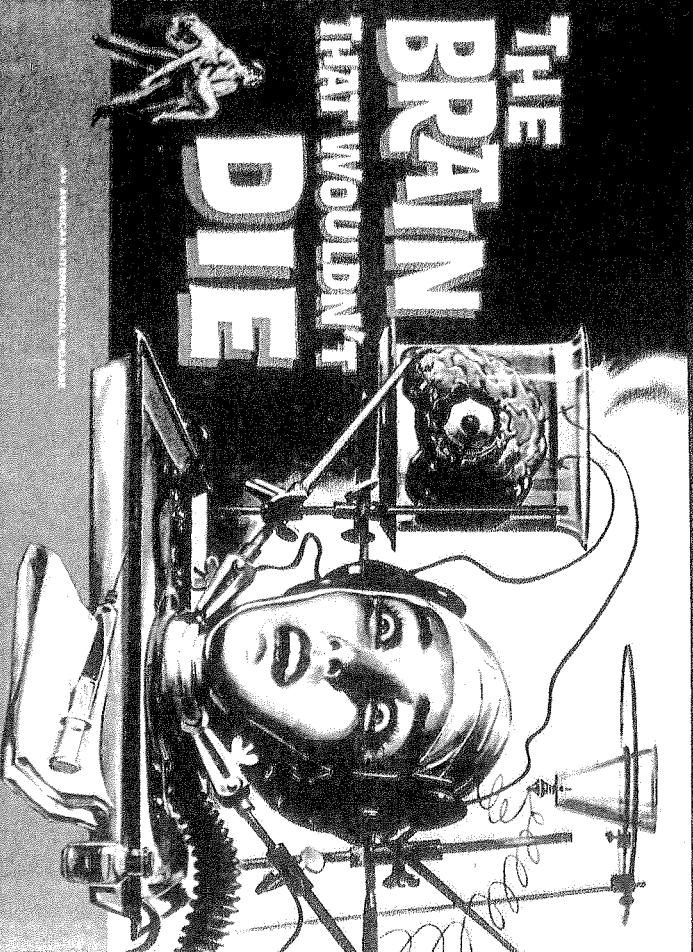
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# CINÉMA&CIE

INTERNATIONAL FILM STUDIES JOURNAL

VOL. XIV, NO. 22/23 SPRING/FALL 2014



## NEUROFILMOLOGY

AUDIOVISUAL STUDIES AND THE CHALLENGE OF NEUROSCIENCE  
EDITED BY ADRIANO D'ALÒIA AND RUGGERO EUGENI

## Dexter's Plastic Brain: Mentalizing and Mirroring in Cinematic Empathy

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### *Abstract*

This essay revisits the question of empathy in film theory by looking at recent neuroscientific findings on affect, emotion and empathy. In film theory there is a classic division between cognitive approaches toward emotional engagement with characters, based on mentalizing or projecting oneself into the situation of another, and phenomenological approaches, based on a more direct embodied experience of mirroring emotional states of characters on screen. Debates in cognitive and affective neuroscience seem to reconfirm these two dominant views on cinematographic engagement: social and cognitive neuroscience demonstrates how we imagine the experience of others in activating the prefrontal and lateral regions of the cortex in projecting a "Theory of Mind." Affective neuroscientist have demonstrated that the activation of mirror neurons in different parts of the brain, such as the anterior insula, and middle anterior cingulate, effectuate an immediate embodied emotion. Both in film theory and in neuroscientific debates, these two views are often opposed and presented as mutually exclusive. This article elaborates the emerging view that both forms of emotional simulation have their own validity and work together in a dynamic network with varying degrees of dominance according to the type of dramatic situation. The television series *Dexter* will be considered as a "neuro-image," an extended and new form of contemporary cinema and will serve as a partner in dialogue in the development of the arguments.

Dexter has a problem. Well, actually, in the course of the eight seasons of the popular television show *Dexter*, the blood-spatter analyst of Miami Metro Police, alias serial killer-with-a-moral-code, will encounter many problems and moral dilemmas – and so will we as spectators. Dexter's main problem, however, is that he is unable of experiencing emotion. At the beginning of the show, he states:

*Whatever made me the way I am left me hollow, empty inside, unable to feel. It doesn't seem like a big deal. I'm quite sure most people fake an awful lot of everyday human contact. I just fake it all. I fake it very well, and the feelings are never there. (Season 1, pilot)*

During the course of the series, as a whole, Dexter's feelings do become a big deal, arguably even the biggest deal of the whole series. Leaving aside all the ethical dilemmas that the television show also raises, in this essay I will focus on Dexter's explicit struggle with emotions and feelings. Taking *Dexter* as a "neuro-image" typical of our digital screen culture, I will relate some of the issues addressed in the series to contemporary findings in affective neuroscience.

*Dexter as neuro-image*

*Dexter* (Showtime, 2006-13) is one of the many contemporary high quality television series that involve extended cinematographic aesthetics. *Dexter* puts us in the mind of a serial killer. Not only do we predominantly stay within Dexter's point of view, but in every episode we hear at regular intervals the reflections running through his head in voice-over. While this use of voice-over is a classic film device for expressing inner speech that has been around at least since Hitchcock's *Murder!* (1930), the long and consistent way in which Dexter Morgan (played by Michael C. Hall) unfolds his deepest thoughts to us is significantly different. In *Murder!* Herbert Marshall plays Sir John Menier, member of the jury of a murder trial who has second thoughts about the conviction of a young woman. His doubts are conveyed to us in an interior monologue that we hear while he is shaving in front of a mirror. Hitchcock's use of the voice-over as expression of thought was innovative (allegedly this is the first use of voice-over used in this way).<sup>1</sup> Nevertheless, the content of his thoughts could also have been conveyed in a dialogue with others, a point proven later in *Murder!* primarily address the narrative of the murder mystery, where doubt about the guilt or innocence in a murder case are the main questions that can and should be shared with others.

In *Dexter* on the other hand, the fact that we, as spectators, are constantly aware of Dexter's innermost thoughts while the people around him are not, is crucial for the basic suspense of the narrative. While in every episode there are murders to solve, and the question of guilt and innocence is part of practically all sub-stories throughout the series, the predominant questions are played out inside Dexter's head, unobservable to others around him. The suspense in *Dexter* is largely due to the tension between knowing how he perceives himself and how he is perceived by others. This inward turn into a character's head space is characteristic of a mode of cinematography that I have called elsewhere "the neuro-image."<sup>2</sup> The neuro-image is indubitably to Gilles Deleuze's famous adagio that we

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have to see that "the brain is the screen" and proposes to go beyond Deleuze's own categories of classical movement-images and modern postwar time-images.<sup>3</sup> While there is much to say about the continuities and differences in these cinematographic developments in relation to the brain screen, the main point that I want to highlight here is that one of the ways in which the neuro-image brings us more directly into the brain worlds of characters is by way of emphasizing the affective dimensions of these inner landscapes.<sup>4</sup>

This affective dimension can be addressed on different levels and has various aesthetic effects on its spectators. An important way of assessing these aesthetic developments is by turning to findings in contemporary neuroscience. Adriano D'Alota, for instance, demonstrates how neurophenomenology of the film experience offers a psychophysiological way of understanding suspense.<sup>5</sup> While narrative comprehension of the story is still an important source of suspense, there are also other levels of more directly embodied cognition that play an important role. D'Alota explains that the tension between feeling with the characters (via perception of affordances through canonical neurons in association with mirror neurons) and the perception of one's own bodily situation (that often gives contradictory information between the optical and the haptic situation of the viewer) gives new insights into the film experience, exemplified in the contradictory experience of the "tangible intangibility" of cosmic space travel films.<sup>6</sup>

Another way of understanding the primacy of the affective in resonance with new findings in cognitive neuroscience is by way of the concept of the "neuro-contemporary cinema that is characterized by complex forms of narration, influenced by a digital logic of feedback looping, parallel lives and remixed storylines, but also extends to the long and rich new forms of television dramas and converged narratives in the wider media landscape. See the discussion on the television series *Lost* in *Iai*, pp. 156-185. One has to note that the film aesthetics or narrative does not necessarily needs to emphasize the "head space" of a character. In an extension of this argument, the whole media world can be considered as a "brain world."

<sup>1</sup> Gilles Deleuze, "The Brain is the Screen," in Gregory Flaxman (ed.), *The Brain is the Screen: Deleuze and the Philosophy of Cinema*, University of Minnesota Press, Minneapolis 2000, pp. 365-373; Id., *Image-mouvement. Cinema 1, Les éditions de Minuit*, Paris 1983 (*Cinema 1: The Movement-Image*, The Athlone Press, London 1986); Id., *Image-temps. Cinema 2, Les éditions de Minuit*, Paris 1985 (*Cinema 2: The Time-Image*, The Athlone Press, London 1989). Deleuze was particularly inspired by Jean Pierre Changeux's book on "neuronal man" that came out in the early 1980s. However, as Raymond Bellour argues, "While Deleuze recognized the cinema as brain (or brain-body), it is essential for a neurobiologist to be able to recognize the brain (brain-body) as cinema" Raymond Bellour, "Deleuze: The Thinking of the Brain," in *Cinema Journal of Philosophy and the Moving Image*, no. 1, 2012, p. 83. See also Jean-Pierre Changeux, *Élémentaire neuronal*, Eyraud, Paris 1983 (*Neuronal Man: The Biology of Mind*, Princeton University Press, Princeton 1997).

<sup>2</sup> Other dimensions of *The Neuro-Image* are the hallucinatory powers of images that are experienced as "realities of illusion" (as opposed to the classic idea of cinema as "illusion of reality") and the complex experience of time as serialized folds and feedback loops that are thought from a future perspective.

<sup>3</sup> Adriano D'Alota, "The Intangible Ground: A Neurophenomenology of the Film Experience," in *NECSUS: European Journal of Media Studies*, no. 2, 2012, pp. 219-239, <http://www.ingentaconnect.com/content/amp/necsus/2012/00000001/00000002/art00012>.

<sup>4</sup> *Iai*, p. 222.

<sup>1</sup> See François Truffaut, *Hitchcock by François Truffaut*, Simon and Schuster, New York 1967, p. 53. See also the description of *Murder!* at *BFI Screen Online*, <http://www.screenonline.org.uk/film/id/437872>.

<sup>2</sup> Patricia Pieters, *The Neuro-Image: A Deleuzian Film-Philosophy for Digital Screen Culture*, Stanford University Press, Stanford 2012. The concept of the neuro-image does not only comprise

thriller." In *The Neuro-Image* I argue that it is possible to understand for instance Andrea Arnold's contemporary surveillance film *Red Road* (2006) as a form of neuroaesthetics where, as spectators, we are drawn into a fight between the main character's immediately experienced "subpersonal" unconscious emotions and her more appropriated "personal" and conscious feelings.<sup>7</sup> Though both processes of emotions and feelings are recognized as forms of affective response in cognitive neuroscience and are embodied in the brain, they do operate on different levels of levels or even in different brain circuits that are connected in often asymmetrical ways. It is that tension that is played out on a neuronal level, while being fully embodied and embedded in a setting and expressed in the aesthetics of the images, that I propose as typical for the neuro-image and the neuroturn in film theory.

*Dexter* adds yet another way of looking at primacy of the affective in contemporary audiovisual culture. As already indicated, Dexter's main problem concerns porous connections to others, feelings and emotions that he does not seem to grasp. About half of his voice-over musings concern his analytic observations of the emotions and feelings of others, comparing them to his own lack of this spectrum of experience. The other big part of the externalization of his mindscape is dedicated to the appearances of his stepfather Harry, who always returns from the dead to discuss the moral dimensions of his actions (is he killing according to the code of only killing bad guys, is he not transgressing in such a way that he could get caught, covering his tracks, etc.). While these moral aspects of Dexter's mind are very interesting and important, they go beyond the scope of this essay. What interests me here is the way in which Dexter somehow fights a battle between two forms of empathy and emotional simulation that resonate with larger debates in cognitive neuroscience, and in discussions between phenomenological and cognitive branches of film studies. So in the following I will consider Dexter as an "aesthetic figure" that on an implicit level connects to these debates.<sup>8</sup> As a fictional character, Dexter expresses in a popular way current knowledge and concerns on empathy and emotion, and as such can be considered as an (unexpected) partner in dialogue in the larger field of affective studies in neuroscience and art.

#### *Dexter's evolving problem*

As already indicated, the premise of *Dexter* is based on the idea that its protagonist Dexter Morgan is unable to experience any deeply felt emotion, even though there are people that care about him. The introduction of his stepfather Debra

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(Jennifer Carpenter) is accompanied by his reflection in voice-over: "She loves me – that's nice. I don't have any feelings but if I could have them I would have them for her." Also his colleagues at the police department like him. While in his work as a blood pattern analyst this emotional distance is considered as professionalism, Dexter himself feels like the world is staged without his participation: "I dream I'm floating on the surface of my own life. Watching it unfold. Observing it. I'm the outsider looking in" (Season 1, episode 2). And observing and analyzing the emotions and feelings of others, he understands very well that the social codes demand that he acts according to the norms of socially accepted empathic conduct.

Initially Dexter has no clue about sexual relationships either, but he has figured out that a girlfriend would make him seem more normal. And so he engages in a relationship with Rita (Julie Benz), finding examples of conduct in the people and cases he encounters. When Dexter in one of his killings has caught a murderous husband and his wife (who knew about the crimes of her husband), they proclaim their love for one another while tied to Dexter's plastic foil covered slaughter bench. Back home, Dexter takes away parts of this strange declaration of love to convince Rita of his feelings for her (Season 1, episode 5). And even if he does not feel anything, his performance is convincing. After Rita gets pregnant and Dexter in a seemingly loveless way has unsuccessfully proposed to marry her, he copies and adapts the words of a confession of a murderer and delivers them showing up unexpectedly at Rita's place:

*My life has always felt like an unanswered question. A string of days and nights waiting for something to happen but I didn't know what. Rita, we're connected. Whenever I am, I feel you and the kids with me. And that makes me real. I want us to always go out for banana splits. And replant the lemon tree that keeps dying. And I never ever want to miss a pizza night. And that's how I know I want to marry you. Because something as simple as pizza night is the highlight of my week. (Season 3, episode 4)*

This time with the desired result. So Dexter becomes a husband, a father and family man. All along "honoring his crafts" and "working diligently" to find himself in a "role for a life time," to paraphrase Dexter's inner musings (Season 3, episode 4).

The only moments when he feels himself and is not acting is when he follows his killer instincts, his "Dark Passenger" as he calls it: "He's all I've got. Nothing else could love me, not even... especially not me" (Season 2, episode 3). However, during the course of the years (eight seasons), slowly but surely all his lies and performances start to turn into something else. Taking Dexter's sometimes strange behaviour for a drug addiction, Rita sends Dexter to an NA support group. Here Dexter finds himself talking about his Dark Passenger to others (who take it as a metaphor for narcotic addiction), confessing that lately he starts to feel connected to something other than his addiction: "It's like the mask is slipping and things... people... who never mattered before are suddenly starting to matter. It scares the hell out of me" (Season 2, episode 3). And while Dexter here is still lying (obviously about the true nature of his addiction) it also occurs to him that people like Deb, Rita and his son Harrison become important to him, even

<sup>7</sup> Patricia Pisters, *The Neuro-Image: A Deleuzian Film-Philosophy for Digital Screen Culture*, cit., pp. 110-121. See also Patricia Pisters, "The Neurothriller," in *New Review of Film and Television Studies*, no. 2, January 2014, <http://www.tandfonline.com/doi/abs/10.1080/17400309.2014.878153#U3XarvLUSo>.

<sup>8</sup> The term of aesthetic figure was introduced by Gilles Deleuze, Félix Guattari, *Qu'est-ce que la philosophie?*, Les éditions de Minuit, Paris 1991 (*What is Philosophy?*, Verso, London-New York 1994, p. 65).

more so after Rita is brutally murdered at the end of Season 4. "Real feelings" of love and fear start to slip into his performances. Also in the following seasons, Dexter will learn in many different ways about connecting emotionally to others.

*Mentalizing and mirroring: Affective neuroscience and two mechanisms for empathy*

So how does this resonate with findings in affective neuroscience? In the final season of *Dexter* there is a direct reference to the brain when Miami Metro investigates a new serial killer who opens the skulls of his victims and takes out a part of their brain. The killer gets the nickname "the Brain Surgeon" and the homicide department gets help of neuropsychiatrist Dr. Evelyn Vogel (a guest role by Charlotte Rampling). The Brain Surgeon, called Oliver Saxon (Darrin Ingolfsson) leaves messages at Dr. Vogel's doorstep: the anterior insular cortex of his victims in a jar. The anterior insular cortex is an important section of the brain involved in emotion, and thus this killer seems to make an obvious statement about his own lack of emotion (Saxon proves to be more cold and emotionless than Dexter and in the end is revealed as Dr. Vogel's psychopath son who in the past killed his brother). The brain in a jar seems nothing more than a tongue-in-cheek reference to our contemporary obsession with brains and neuroscience. And at a first glance these references seem simply a popular gesture without much depth indeed. But let us take a closer look at affective neuroscience and its possible significance for the understanding of cinematic empathy. Could Dexter possibly have anything to offer to neuroscience?

As D'Aloia and others have pointed out, the study of cinematic empathy certainly did not start with neuroscience.<sup>9</sup> Cognitive branches of film studies have studied empathy in terms of a "theory of mind" which proposes inferences of another person's state of mind based on patterns of recognition in behavior, desires, thinking and other mental structures.<sup>10</sup> On the other end of the film theoretical spectrum are the more phenomenologically inspired embodied forms of sensual and emotional engagement.<sup>11</sup> Both these classic cognitive and phenomenological approaches give valuable insights in the ways in which cinematographic aesthetics engages its spectators without any reference to neurophysiology. However, since important branches of contemporary neuroscience emphasize the significant role of embodiment in any kind of processes of the brain, perhaps the classic division between mind/cognition versus body/phenomenological experience might be rethought in new and perhaps more productive ways.<sup>12</sup> This has already

led to interesting explanations of embodied cognition in film experience, for instance from an evolutionary neuroscientific perspective.<sup>13</sup>

However, even within the general acknowledgement of the embodied (and embedded, extended and enactive) nature of our neurological processes in affective neuroscience, a new (but actually very familiar) split seems to reproduce itself around the complex notions of empathy and emotions. In any case, within affective neuroscience, there seem to be two camps, each defending a different mechanism for empathy. On the one hand there are those who defend empathy via direct embodied simulation related to the phenomenon of mirror neurons that get activated both when experiencing oneself emotions and when anticipating or observing someone else's affective states.<sup>14</sup> On the other hand there are those who defend a different circuit for empathy and emotional engagement, one that is closer to the idea of a theory of mind that relate more to a set of brain areas that allow mentalizing and perspective sharing in top down cognitive processes of self-projection at a distance from the other.<sup>15</sup> Both these mechanisms for empathy are neurophysiologically materialized. Mirroring systems operate in a set of regions in the inferior frontal cortex, superior parietal lobe, the anterior cingulate cortex and the anterior insula; mentalizing systems are more related to the prefrontal cortex, the temporal junction and the medial prefrontal cortex.<sup>16</sup> Both mechanisms operate in our brain and have different functions in relation to emotional engagement that seem to be separate systems. At best, these systems are acknowledged to complement one another. Very often, however, and depending on one's theoretical inclination (towards a cognitivist embodied mind or towards a phenomenological enminded body), one of the two mechanisms is preferred at the exclusion of the other.

In her article "Both of Us Disgusted in *My Insula*," for instance, Ruth Leys argues that "our knowledge of other minds cannot be explained by an appeal to

<sup>9</sup> Adriano D'Aloia, "The Intangible Ground: A Neuropsychology of the Film Experience," cit.

<sup>10</sup> See for instance Murray Smith, *Engaging Characters: Fiction, Emotion and the Cinema*, Clarendon Press, Oxford 1995.

<sup>11</sup> See for instance Laura U. Marks, *The Skin of Film: Intercultural Cinema, Embodiment, and the Senses*, Duke University Press, Durham-London 2000; Vivian Sobchack, *Carnal Thoughts: Embodiment and Moving Image Culture*, University of California Press, Berkeley 2004.

<sup>12</sup> See for instance John Protevi, *One More Next Step: Deleuze and Brain, Body and Affect in Con-*

*temporary Cognitive Science*, in Rosi Bradiotti, Patricia Pisters (eds.), *Rethinking Normativity with Deleuze*, Bloomsbury, London 2012, pp. 25-36.

<sup>13</sup> See Torben Grodal, *Embodied Visions: Evolution, Emotion, Culture and Film*, Oxford University Press, Oxford 2009. Grodal introduces here his model of PECMA flow. According to this theory spectators engage via Perception, Emotion and Cognition toward Motor-Action. See also Murray Smith who in his recent work proposes a triangulated methodology between phenomenological, psychological and neurological evidence related to aesthetic experience: Murray Smith, "Triangulating Aesthetic Experience," in Arthur P. Shimamura, Stephen Palmer (eds.), *Aesthetic Science: Connecting Minds, Brains and Experience*, Oxford University Press, New York 2012 pp. 80-106.

<sup>14</sup> See for instance Vittorio Gallese, "The Shared Manifold Hypothesis: From Mirror Neurons to Empathy," in *Journal of Consciousness Studies*, no. 8, 2010, pp. 33-50; Id., "Embodied Simulation: From Neurons to Phenomenological Experience," in *Phenomenology and Cognitive Sciences*, no. 4, 2005, pp. 23-48.

<sup>15</sup> See for instance Helen Gallagher, Christopher Frith, "Functional Imaging of 'Theory of Mind,'" in *Trends in Cognitive Sciences*, no. 7, 2003, pp. 77-83.

<sup>16</sup> See Frank van Overwalle, Kris Baetens, "Understanding Others' Actions and Goals by Mirror and Mentalizing Systems: A Meta-Analysis," in *NeuroImage*, no. 48, 2009, pp. 564-584; Adam Waytz, Jason P. Mitchell, "Two Mechanisms for Simulating Other Minds: Dissociations Between Mirroring and Self-Projection," in *Current Directions in Psychological Science*, no. 20, 2011, pp. 197-200.

a simple mechanism of mutual resonance or mutual attunement [as proposed in the mirror-neuron mechanism].<sup>17</sup> Ley's rightly warn against any neuroscientific reductionist and grand claims of finding "unifying mechanism for understanding the behavior of others,"<sup>18</sup> as the neuroscientific study Ley's discusses seems to claim. As if indeed the anterior insula could be isolated (in an fMRI scan or in a jar) and explain something as complex as emotions by these specific neuronal processes alone. Also more generally a critical approach toward neuroreductionism remains important to bring into the discussions as to anchor scientific findings about the brain in social and cultural contexts and to draw attention to implicit presuppositions and positions in scientific experiments.<sup>19</sup> Conversely, it is unproductive to reject important neuroscientific findings in respect to empathy in a fight between complete "embodied mirroring" versus "cognitive inferences at a distance from the self."<sup>20</sup> So are there other ways to look at these two systems and the way they could possibly interact?

In a recent neuroscientific study on empathy Gal Raz *et al.* propose a dynamic model that allows asking new questions.<sup>21</sup> At the beginning of the article "Cry for Her or Cry with Her" the authors set out the two dominant models of empathy and already mentioned: embodied simulation (ES) found in the anterior insula and other mirror neuron regions, and theory of mind (ToM) related to prefrontal areas of the brain. They are careful in pointing out that the ES-ToM distinction is not the same as the difference between affective and non-affective empathy. Therefore they also include a third system in the brain, the core limbic network (including the amygdala, hypothalamus and hippocampus) that has been implicated in basic low level affective processing, including the rapid evaluation of the valence of a stimulus and the generation of bodily arousal in reaction to it:

*ES and ToM-related circuits are assumed to have distinctive anatomical connectivity profiles and evolutionary and ontogenetic histories, which qualify them as systems spe-*

*cialized in processing different types of information. Although interoception or cognition may often not develop into a full-blown emotional experience, under certain conditions these processes may also drive intersubjective sharing of emotions as they integrate with relevant input from other perceptual and limbic domains. The relative contributions of each of these systems and their interactions with limbic structures to one's empathic reaction are within the main focus of this study.*<sup>22</sup>

The study sets out to prove that these regions are dynamically interrelated networks. And in order to produce a more holistic and realistic approach that includes multi-modal stimuli, development over time, embodied and embedded situations, cinematic empathy was the preferred mode of emotional engagement. The experiment was set up by comparing the neural connectivity of test subjects during two movie excerpts of about ten minutes: similar empathy-evoking scenes where a mother has to say goodbye to her children from *Stepmom* (Chris Columbus, 1998) and *Sophie's Choice* (Alan Pakula, 1982). These findings were matched with other tests, such as self-reports and questionnaires about the viewer's emotional experiences watching the clips. The reported findings are remarkable. Not only did the two excerpts provoke significant more neuronal activity in either the insular-cingulate (ES) circuit (*Sophie's Choice*) or the prefrontal-temporo-parietal (ToM) circuit (*Stepmom*) but the data also showed dynamic and changing patterns of connectivity of these circuits as well as growing interaction with the limbic system when the empathic engagements became stronger.<sup>23</sup>

There are several primordial things to mention in relation to this study. First of all, these findings indicate that instead of asking whether we engage via embodied simulation or via theory of mind, it is more interesting to ask when and why one networked circuit is more dominant than the other and how these networks might influence one another. The authors indicate that one reason for more immediate embodied responses in *Sophie's Choice* could be that the situation in this film is related to an immediate present danger: in this scene the mother (Meryl Streep) is forced by a Nazi officer to choose in a split second between one of her children. This activates in the spectator first-person affective information from his/her own low-level limbic structures (such as the amygdala, which is our fear center). Moreover, aesthetically this scene is shot in expressive close-ups,<sup>24</sup> which also triggers immediate affective reactions that involve mirror-neurons. They are what Deleuze has called affection-images, that operate immediately on our brain screen.<sup>25</sup> In *Stepmom* the dramatic situation is similar but different as well: in this separation scene a mother (Susan Sarandon) is terminally ill and says goodbye to both her children, though we do not see her die in the film and

<sup>17</sup> Ruth Ley's, "Both of Us Disgusted in My Insula": Mirror Neurons Theory and Emotional Empathy," in *Neurosite.org*, no. 5, 2012, p. 16. Ley's criticises here the article by Bruno Wicker, Christian Keyser, Jane Plailly, Jean-Pierre Royet, Vittorio Gallese, Giacomo Rizzolatti, "Both of Us Disgusted in My Insula: The Common Neural Basis of Seeing and Feeling Disgust," in *Neuron*, no. 40, vol. 3, 2003, pp. 655-664.

<sup>18</sup> Bruno Wicker *et al.*, "Both of Us Disgusted in My Insula": Mirror Neurons Theory and Emotional Empathy," *cit.*, p. 655.

<sup>19</sup> Suparna Choudhury, Jan Slaby, *Critical Neuroscience: A Handbook of the Social and Cultural Context of Neuroscience*, Blackwell Publishing, Malden (MA)-Oxford 2012.

<sup>20</sup> See for instance Vittorio Gallese, David Freedberg, "Motion, Emotion and Empathy in Esthetic Experience," in *Trends in Cognitive Science*, no. 10, 2007, p. 197-203. In the same issue Roberto Casati and Alessandro Pignocchi react in a letter entitled "Mirror and Canonical Neurons are Not Constitutive of Aesthetic Response" (p. 410) and Gallese and Freedberg respond with another letter "Mirror and Canonical Neurons are Crucial Elements in Esthetic Response" (p. 411).

<sup>21</sup> Gal Raz, Yael Jacob, Tal Gonen, Yonatan Winetraub, Tamir Flash, Eyal Soreq, Talma Hendler, "Cry for Her or Cry with Her: Context-Dependent Dissociation of Two Modes of Cinematic Empathy Reflected in Network Cohesion Dynamics," in *Social Cognitive and Affective Neuroscience*, no. 9, vol. 1, 2014, pp. 30-38.

<sup>22</sup> *Ibid.*, p. 31.

<sup>23</sup> *Ibid.*, p. 35.

<sup>24</sup> This is also proposed in an interesting article by Jane Stadler, "Affectless Empathy, Embodied Imagination and *The Killer Inside Me*," in *Screening the Past*, no. 37, 2013, pp. 1-17. Stadler also gives an account of various important film theoretical approaches to empathy and engagement.

<sup>25</sup> Gilles Deleuze, *Cinema 1: The Movement-Image*, *cit.*, p. 87-101.

the family situation for the children is stable. Here the ToM responses are more strongly activated in cognitive functions such as thinking about the future. This networked circuit is more related to the projection of one's own self as in a third-person perspective, as if one is an external observer projecting one-self in the situation of another. Here too, we can add that aesthetically the cinematography of the scene in more distant medium shots is an important factor in creating this particular affective engagement. Both scenes, however, are very emotional in their activation of affective circuits that are not mutually exclusive but do seem to operate with different hegemonic intensities.

Obviously much more remains to be said about these scenes in particular and (cinematic) empathy in general, but bringing in context-dependent and aesthetic variables, and considering the different empathic areas as networks that can interconnect dynamically and that with variegated intensities “hook up” with the limbic system, seem to be very valuable insights that could unlock perhaps some of the blockages in the encounters between cognitivist and phenomenological approaches in cinema and in neuroscience. Granted, this is a big claim, so let us return more specifically to *Dexter*.

#### *Dexter's plastic brain*

I would like to suggest that these scientific insights that play out on a neuronal level, can also be traced on a narrative level, related to the emotional journey that Dexter undertakes. In the first seasons, Dexter feels like a spectator of his own life. He has adopted a third-person perspective and observes the emotions of others that he then imitates, faking them so well that nobody in his environment sees the difference. Perhaps we could say that he is “conditioned by an inherent theatricality [...] making persons into actors and spectators who distance themselves from each other and even from [himself].”<sup>26</sup> From this perspective mirror neuron embodied simulation equals “the possibility (the dream) of complete sympathetic merger or identification.”<sup>27</sup> And theatricality or performance creates the necessary third person distance for engagement. But Dexter seems to be stuck in this theatricality. He is unable to mirror directly anything. While according to critics of mirroring systems for engagement this only prevents us from the false dream of merging with the other, Dexter, having only his staged emotions, thinks of himself as a monster, a non-human who can never live a full life.

However, he proves himself wrong. In the course of the following seasons, Dexter has so many encounters, both with partners in crime as well as with people that deeply care about him, that he begins to think that he might be human after all. He meets Lumen Pierce (Julia Stiles) who teaches him that “nothing is

set in stone, not even darkness” (Season 5, episode 12). Dexter's brain is plastic and dynamic and changes in and through the encounters he has. In the last seasons he even falls in love with Hannah McKay (Yvonne Strahovski). And he finds that “somewhere along the line the fake life that we created as a cover to kill became real. It is not fake anymore” (Season 7, episode 12). In the very last season Dr. Vogl also becomes important to Dexter (she is the one who in the past advised Dexter's stepfather Harry to reach him “the code”). When she is killed by Saxon/the Brain Surgeon in front of Dexter's eyes, there is no more voice-over, but we see his emotions in his facial expression.

Most importantly, however, is the relationship to his sister. It is Debra who shows Dexter that he has always been a good brother to her. And in the end Dexter not only thinks he would have feelings for her if only he could, but he actually has feelings. In the series finale Debra gets wounded and sinks into a coma. And instead of running off with Hannah and Harrison to a new life in Argentina as was the plan, Dexter puts an end to Debra's life, stages his own death and departs to a remote area where he lives in a self-imposed prison – not connecting to anyone anymore, out of fear of hurting the people he has come to love. As the producers of the show explain this is Dexter's tragedy: “[The one thing we felt Dexter wanted more than anything was human connections. [...] Now that he's finally made that journey and he's almost poised to have a real human life, he has to give all that up to save Harrison and Hannah.”<sup>28</sup> Much more could be said about Dexter but what I wanted to highlight here is that his emotional journey, expressed in the highly popular form of a television show that can be considered as a form of extended cinematography that is part of the neuro-image, is a very interesting one. Because of its development over a long period of time, the show goes beyond pure fantasy, showing us a character struggling with his own engagement with the world, with people around him. Dexter starts out engaging only by simulating what he knows of the emotions of others (mentalizing, ToM), but he finds out that by simulating he develops new and more embodied feelings as well (mirroring, ES). Dragging us all along into his mental world, he shows that the different emotional circuits in the brain are in continuous dynamic interaction. And in this way *Dexter* might give us a dramatic cinematic perspective on empathy and emotion that enters in dialogue with findings that affective neuroscience proposes on a synaptic level. We might have become “neuronal men” but we will need a holistic and interdisciplinary approach to develop new thoughts about engaging and connecting to others in cinema, and in life.

<sup>26</sup> Ruth Lewis, “Both of Us Disgusted in My Insula”: Mirror Neurons Theory and Emotional Empathy,” *cit.*, p. 16.  
<sup>27</sup> *Ibidem*.

<sup>28</sup> James Hibberd, Interview with Scott Buck and Sarah Colleton, in *Entertainment Weekly*, 13 September 2013, <http://insider.ew.com/2013/09/23/dexter-interview-series-finale>.