

Mirror Neuron on the Wall, Who's Most Active of Us All?

Paper Abstract

The interdisciplinary study which E-MAPS proposes - a study between Cognitive Neuroscience, Cognitive Psychology, Philosophy, Performer Studies and Sports Science - might strike one as being odd. In other words, how could the work of the performer function as a locus for brain research? In this paper I seek to analyse one such research possibility: the perception of goal-related actions. The neural patterns evident when an individual performs a goal-related action, as well as when he observes that same goal-related action being performed by another agent, are strikingly the same. This neural pattern is referred to as "mirror neuron" activity. In my paper I propose to show that the major theatre makers of the 20th century had, on analysing the way that the actor enters in a relationship with the spectator, an awareness of this process. They, however, lacked the vocabulary and the expertise to term the process as such.

The Active Spectator

One of the major calls for theatre reform in the early years of the twentieth century was the shaking off of the spectator's passive consumption of the theatrical event. Today we refer to theatrical event as an act of confession from the actor, a confession which in the moment of performance becomes an

invitation for the spectator to do likewise.¹ In the early years of the twentieth-century, however, what was most evident was a passivity which Adolphe Appia for instance linked with consumerism. Appia speaks of the spectator who went to the theatre of his time as keeping himself at a distance from the work of art, approaching 'works of art, of whatever sort, like tasters; it is there, we are here, each quite separate, and we make the situation even worse by inclination towards minimum exertion.'² We are not here saying of course that the spectator which Appia attacked was just staying there seated in the theatre, staring at what was happening on the stage. The spectator, every spectator, is, of course, in a way or another, always active. He applauds loudly to show his approval, he hisses when he disapproves. The spectator in Appia's time came in late to make an entrance, left early to make an exit.³ The dynamics of the Teatro al' Italiana model, still in those early years of the twentieth century the most popular model of theatre building, gave the spectator ample possibility to gaze around at the auditorium, looking for other personalities in the audience. This of course, is not the kind of active participation which was demanded by the theatre-makers of the early years of the twentieth century. The kind of participation which was demanded was a creative one, organically linked to what was happening on stage, defined not through who was in the auditorium, but through the stage action.

Meyerhold expounds very clearly about this creative participation, going at great length to even describe the mechanics behind its working. In his early years of

activity Meyerhold speaks not of the spectator's reception of the theatrical event, but of his participation in it. In Meyerhold's terminology, this participation is an exercise of the fantasy, of the spectator's imagination, 'which rises sometimes to the level of creativity.'⁴

Terminology is here an important issue to keep in mind. What terms were put forward by the theatre-makers to denote an active spectator? Michael Chekhov for instance, calls for a spectator who is 'an active co-creator'. For Barba, the spectator is also a doer, because by making an effort at understanding the performance, the spectator's 'seeing becomes action.'⁵ Meyerhold calls the ideal spectator a 'vigilant observer.'⁶ In Meyerhold's vision it is the work of the actor which makes the active participation from the spectator, this vigilant observation, possible. From as early as 1905, Meyerhold was asserting the expressive potential of the performer's presence, what he termed as "the body" of the actor, and its superiority over the spoken word. It is this potential, manifested in what Meyerhold called 'a pattern of movement' that makes the spectator an active and essential element to the theatrical event.

Appia calls the active spectator an artist, and he even goes as far as to announce the death of the term spectator: 'a work of *living art* is the only one that exists completely without spectators (or listeners), without an audience because it already implicitly contains the audience within itself; and because it is a *work lived* through a definite period of time, those who live it – the participants and

creators of the work – assure its integral existence solely through their activity.’⁷ The spectator, in Appia’s vision, merges with the actor to form one organic body of Art. Similarly to Meyerhold, Appia says that it is the actor’s work that makes this bridge possible.

Appia’s and Meyerhold’s vision, even though it was formulated almost a hundred years ago, strikes a clear resonance with contemporary Neuroscientific research. Vittorio Gallese, a brain researcher says the following: ‘when I am going to execute a given action I can predict its consequences. Action is the “a priori” principle enabling social bonds to be initially established. By an implicit process of *action simulation*, when I observe other acting individuals I can immediately recognise them as goal-directed agents like me, because the very same neural substrate is activated as when I myself am bound to achieve the same goal by acting. In sum, my suggestion is that through a process of “motor equivalence” a meaningful link between agent and observer can be established.’ Gallese is here pointing something that theatre-makers were for years already aware of, as Appia and Meyerhold’s words have hinted at: it is the agent’s action that creates the bond with the observer, both in theatre and in life. The ‘*relational* nature of action’, that action itself is always defined in relation to another (be him/it concretely present or not) makes this even more the case. ‘Action’, says Gallese, ‘is relational, and the relation holds both between the agent and the object target of the action, as between the agent of the actions and his/her observer.’ In theatre-making of course, we speak of the actor’s work as having an Alterity

nature, on a studio-working level at first, in relation to the floor, to the props, the text, the clothes, the director, his partners and so on, and then, in performance, in relation to the audience. Performance, and the never ending process which leads to it therefore becomes a locus which makes the study of Action possible.

Mirror Neurons

Returning to contemporary Neuroscientific research, Gallese describes the process of “motor equivalence” which makes the creation of a bond between the action’s agent and his observer possible. Evidence proves that there are specific neurons which make this motor equivalence possible: mirror neurons.

The patterns which are generated when mirror neurons are fired attest for the active process on the part of an observer when he perceives (and understands) the performance of a goal-related action. Gallese says about mirror neurons that ‘whenever we are looking at someone performing an action, beside the activation of various visual areas, there is a concurrent activation of the motor circuits that are recruited when we ourselves perform that action. Although we do not overtly reproduce the observed action, nevertheless our motor system becomes active as *if* we were executing that very same action that we are observing.’⁸ A term Gallese uses is resonance: ‘when we observe actions performed by other individuals our motor system “resonates” along with that of the observed

agents.’⁹ Giacomo Rizzolati, another brain researcher, defines mirror neurons as ‘neurons that discharge both when the monkey makes a particular action and when it observes another individual (monkey or human) making a similar action...A monkey [on whom the discovery of mirror neurons was first made] looks at the action, and while looking at it, in its brain there is a motor replica of it.’¹⁰ The same process is evident in humans.

The identical nature of the mirror neuron patterns generated both when an action is performed as well as when it is observed is therefore the common ground between the agents of action and their observers, making the creation of a relationship possible: ‘This *implicit, automatic, and unconscious* process of motor simulation enables the observer to use his or her own resources to penetrate the world of the other...A process of action simulation automatically establishes a direct implicit link between agent and observer.’ This is also again very evident in theatre. While theatre-makers were able to assert that an active process is at root of the spectator’s perception of the theatrical event, they lacked the necessary neuroscientific evidence to picture exactly the proceedings of this active participation. This, however, did not stop theatre-makers from being aware of both a) the existence of the process and b) the existence of a common ground that makes the relationship between the agent of the theatrical action, the actor, and his observer, the spectator, possible. In the obvious absence of the mirror-neuron terminology, theatre-makers sought to capture the breadth of their thinking using their own terminology. Stanislavski puts this in crystal clear

perspective when he says that he was not a man of science, and consequently he never sought to speak to actors 'in dry scientific language.' The theatre-maker must speak in his language, in the oftenly metaphoric language of theatre-making, a language stemming directly from the praxis. Stanislavski therefore, coins the relationship between an actor (the agent of an action) and the spectator (his observer) as 'an exchange of spiritual energy...that contact of feeling that unites actor and audience with invisible threads.'¹¹ It is a process which is made possible from the actor and the spectator both having a 'soul'¹² (note again the metaphoric terminology), which makes the process of perception a passage from 'subconscious to subconscious'.¹³ Meyerhold on his part speaks of the actor not as a mere presenter of ideas: the actor is on the other hand the one who 'transmits' to the spectator a specific 'excitation'. This excitation is then 'experienced' by the spectator, who in this way shares in the actor's performance.¹⁴

Appia's discourse can be deemed to move one step closer to the motoric terminology which neuroscience presents. The terminology which Appia used to describe what happens between an actor and a spectator has very physical connotations. The term "body" is here often used. As we have seen above, Appia, in his mature phase of work, envisaged a communal, Living Art, 'a living contact with our fellow men.'¹⁵ The creation of the work of Living Art is the actor's responsibility. In performance this Art can be directly communicated to the spectators 'since all alike have bodies.'¹⁶ Appia is here referring to "the body" as

that common ground between the actor and the spectator, a common ground which makes the perception of the actor's Action and actions possible.

Action-Presence-Perception

Neuroscientific research tells us that the motoric behaviour evident in mirror neuron patterns seems not to be an end in itself. It has, in other words, a very specific purpose. Mirror neuron patterns, says Gallese, are the means which make the understanding of action possible, more precisely, the means through which the intention behind the action is understood. The same pattern of mirror neurons in fact fires in relation not to the manifestation of an action, but in relation to its intention. The grasping of an apple for instance, can be carried out from different directions, in different manifestations, from the top for instance, or the bottom, the right or left. 'From a motor point of view all these movements are different, but in terms of meaning they all represent the same action, "grasping".'¹⁷ They are all defined, in other words, by the same intention. The same pattern of mirror neurons was also evident when different objects of different sizes were used in another grasping experiment, because the intention was, again, the same.¹⁸

Action understanding makes social interaction possible. 'We are social animals', says Gallese, and 'living in a complex society requires individuals to develop cognitive skills enabling them to cope with other individuals' actions, by

recognizing them, understanding them, and reacting appropriately to them.'¹⁹ The resulting state between the agent of the action and his observer is called by Gallese, Empathy.

Edith Stein, in her book *On The Problem of Empathy*, asserts that the common though limiting definition of Empathy is 'a simple grasp of other's feelings or emotions.'²⁰ The term and this definition are commonly used both in colloquial discourse, as well as in the theatrical one. In theatre it has been traditionally ascribed to denote the emotive relationship between the actor and the spectator. In various trends of theatre-making, especially those which take as their basis Stanislavski's erroneously translated works in English, the experience of a specific emotive state is what is asked from the actor. The spectator is then induced to share in that same emotive state. Martin Esslin for instance says that 'If the emotion of the character is truly felt, the expression of it will spontaneously manifest itself to the audience.'²¹ Such a definition of empathy was often attacked by theatre makers.

Gallese starts out by referring to this traditional Arts-stemming definition of Empathy, but proposes a reappraisal of the term, quoting in turn the phenomenologist Husserl. Empathy, according to Husserl, goes much beyond the narrow emotive identification and 'emphasises the role of the acting body in perceiving. To use a modern terminology, we could say that according to Husserl there can be no perception *without awareness of the acting body*...what makes

the behaviour of other agents intelligible is the fact that their body is experienced not as material object, but as something alive, something analogous to our own experienced acting body. Empathy is deeply grounded in the experience of our lived-body, and it is this experience that enables us to recognise others not as bodies endowed with a mind but as *persons* like us.²² Gallese here emphasises over and over again the importance of the agent's "body". The roots of empathy are therefore motoric ones, evident in mirror neuron patterns, rather than emotive ones: 'the neural matching mechanism constituted by mirror neurons is crucial to establish an emphatic link between different individuals.'²³ We perceive and understand action because as observers, we identify the "acting body" with "our own acting body." We can in other words emphatically relate to each other because, recalling Appia's words, "we... all alike have bodies."

In contemporary theatre terminology, the term "body", as well as its connotations denoting possessive and disposable qualities, like "the body", or "my body", is, of course, no longer valid. The term "presence", which has artificial connotations, artificial in the sense of creating with Art, is what contemporary theatre-making is both using and analysing. Building on Gallese's statements, one can say that there can be no perception without the awareness of the agent's presence and the bond which it strikes with the observer's presence. The key to this presence and to its end perception is, as we have seen, both in theatre and in life, Action. Action, presence and perception thus intertwine. In theatre this is more so the case. It is in fact the actor's work to seek to knowingly use action as the basis to

create in performance an extra-daily presence, an extra-daily presence through which he then seeks to encounter the spectator: 'The witnesses then enter into states of intensity because, so to say, they feel presence. And this is thanks to *Performer*, who is a bridge between the witness and...something. In this sense, *Performer* is *pontifex*, maker of bridges.'²⁴ Action, presence and perception, again intertwine.

Conclusion

In this paper I sought to discuss one area of research, the role of Action and mirror neurons in the establishing of relationships between agents, or actors, and observers, or spectators, thus proving that theatre-making and neuroscience do share common interests. My hope is that in this way I have proved, as the E-MAPS Mission Statement says, that the eventual Masters Programme will be 'an invitation to would-be researchers to start considering the highly complex training process which contemporary performers undertake (be they active in theatre, dance or sports) as a locus for research in the fields of Learning, Memory and Creativity.' The days when Science and Art are envisaged as two disparate fields with no possibility of bridging, are, hopefully, over:

Endnotes:

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- ¹ Jerzy Grotowski, *Interview with Grotowski* with R.Schechner and T.Hoffman (1968), in *The Grotowski Sourcebook*, ed. By R.Schechner & L.Walford (London and New York: Routledge 2001) pp. 43-44
- ² Adolphe Appia, *Return to Music* (1906), in *Texts on Theatre*, ed. R.C.Beacham, (London and New York: Routledge 1993)p. 77
- ³ Konstantin Stanislavski, *My Life In Art*, trans. By G.Ivanov-Mumijev (Moscow: Foreign Language Publishing House, undated) p. 34
- ⁴ Vsevolod Meyerhold, *The Naturalistic Theatre and the Theatre of the Mood* (1906), see Braun, E., *Meyerhold On Theatre* (London: Methuen and Co. 1969) p. 25
- ⁵ Eugenio Barba quoted in I.Watson, *Towards A Third Theatre*, p. 99
- ⁶ Meyerhold quoted in *Meyerhold: A Revolution In Theatre*, (United Kingdom: Methuen 1995) p.
- ⁷ Appia, *The Work of Living Art* (1919) in *Texts on Theatre*, p. 168
- ⁸ Gallese, "The "shared manifold" hypothesis: from mirror neurons to empathy", in *Journal of Consciousness Studies* (2001)
- ⁹ *ibid.*
- ¹⁰ G. Rizzolati *et al*, *Resonance behaviours and mirror neurons*
- ¹¹ Stanislavski interviewed in *Peterburgski Kurior*, May 1, 1914; quoted in J.Benedetti, *Stanislavski: His Life And Art*, (Great Britain: Methuen 1999) p. 203
- ¹² Stanislavski B7.75
- ¹³ F.Malcovati in the Introduction to *Il Lavoro dell'Attore Su Se Stesso*, K.Stanislavski, (Roma-Bari: Editori Laterza 2000) p. xxvii
- ¹⁴ Meyerhold, *Biomechanics* (1921), Braun, *Meyerhold on Theatre*, p. 199
- ¹⁵ Appia p. 10
- ¹⁶ Appia p. x
- ¹⁷ G. Rizzolati *et al*, *Resonance behaviours and mirror neurons*
- ¹⁸ *ibid*
- ¹⁹ Gallese, *The "shared manifold" hypothesis: from mirror neurons to empathy*
- ²⁰ *ibid.*
- ²¹ Martin Esslin, *The Field of Drama*, p. 62
- ²² Gallese, *The "shared manifold" hypothesis: from mirror neurons to empathy*
- ²³ *ibid.*
- ²⁴ Jerzy Grotowski, *Performer* (1990), in *The Grotowski Sourcebook*, ed. By R.Schechner & L.Walford (London and New York: Routledge 2001) p. 377