

## TOURISM AND NEUROSCIENCE: A PRELIMINARY APPROACH

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*Tourism studies, generally considered multi-, inter- and even post-disciplinary, has not yet embraced neuroscience, despite the fact that the latter has been extending its domain in the last decades, opening up to human consciousness, as well as to social issues, arts and the humanities. This paper argues that it is also necessary for tourism social studies to take into account recent developments in this field. Bearing in mind a broad conceptualization of the tourist experience, an attempt will be made to indicate formulations in neuroscience which potentially cast new light on various aspects of tourism. The following points are evidenced: post-cartesian embodiment (seemingly already a common background); so-called qualia, linked to phenomenological experience; the issue of the 'extended mind'; the discovery of mirror neurons; neuroethics, which can clearly be seen in relation to the ethics of tourism. In conclusion, the recent popularization of neuroscience through brain imaging is briefly explored.*

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### INTRODUCTION<sup>i</sup>

There is often talk of inter-, multi-, more recently even of post-disciplinarity in the field of tourism studies (Przesławski, 1993; Tribe, 1997; Coles, Hall and Duval 2009), which responds to the need to keep abreast of latest developments, e.g. Tribe (2009) in the case of philosophy and MacCannell (2011) in the case of ethics. Surprisingly, there has been no such interest regarding neuroscience. The recent *Neuro-mania* (Legrenzi and Umiltà, 2009) has had little effect on tourism science, although some consequences of neuroscience are filtering through in the form of 'neuroeconomy', 'neuromarketing' and 'emotional marketing',

where neural nets and a computational approach are at work. And yet the achievements of neuroscience, together with the incredible progress made in genetics and biology and the development of cognitive science, have radically changed the overall framework in which so-called human nature can be examined (Gardner, 1987; Di Francesco, 2007a)<sup>ii</sup>.

We clearly cannot dwell upon the fundamentals of neuroscience here, a field where the literature is in constant growth (Kandel, Schwartz and Jessell, 2000; Oliverio, 2008; Edelman 2004). Suffice to mention the astonishing number of neurons – over 10 billion – in the human brain, the estimated 10 trillion synaptic connections, and the complexity of neural architectures involving a plurality of levels, such as neurons, local circuits and subcortical nuclei which are connected in systems and systems of systems (Damasio, 1999: 331). In such a context, neural architectures, being dynamic and continually redistributed, through their constant evolution and mutability, may very well call into question the stability of traditional concepts, such as image, which directly affect tourism studies<sup>iii</sup>.

It is therefore argued that an adequate theoretical apparatus, informed by the current state of the art in neuroscience, is necessary when dealing with a multilayered and multifaceted phenomenon like tourism where, from a social and psychological point of view, the human being is positioned at the center. In particular, our intention here is to concentrate on just a few points regarding neuroscience, guided by previous research which has explored this very field in recent decades. At the same time, an eye will be kept on tourism from a qualitative, social science point of view and particularly on the tourist experience (Ryan, 2002; Uriely, 2005; Andrews, 2009). The following five issues are therefore discussed: 1) a general post-Cartesian attitude, which can be identified with *embodiment*, where there seems to be a point of contact with tourism studies; 2) the attention devoted to *qualia*, that is, to the phenomenological experiences affecting tourism social studies; 3) the problem of the *extended mind*, coupled with the definition of active externalism; 4) the discovery of *mirror neurons*, implying unforeseen consequences on the social aspects of human behavior; 5) the recent broad conceptualization of *neuroethics*, which can relate to various substantial aspects of the ethical problems concerning tourism. As a brief conclusion, *brain imaging (neuroimaging)*, obtained in particular from fMR (functional Magnetic Resonance), is seen as an intrinsic breakthrough for neuroscience; it represents a popularized cartography of the mind to consider — albeit with caution — in relation to tourism studies.

## EMBODIMENT: A POST-CARTESIAN ATTITUDE

Neuroscience and cognitive science have moved further and further away from traditional Cartesian dualism, which indeed now seems superseded. Rapid developments were made in the Nineties, starting with the much-quoted *The Embodied Mind* (Varela, Thomson and Rosch, 1991), although Varela, a biologist, still held a connectionist version of cognitivism. In 1994 the neurophysiologist Antonio Damasio published *Descartes' Error* (1994), emblematic of post-cartesian positions, providing a unified vision of reason, emotions and sentiment, which was a fundamental stage in the move from medical scientific neuronal assumptions to a more unitary discourse. As Damasio himself maintains in a subsequent work, *The Feeling of What Happens*, subtitled *Body and Emotion in the Making of Consciousness*, it is Spinoza, not Descartes, that we should consider our philosophical forebear (Damasio 1999). A relatively more recent thinker, the psychologist William James, is quoted for his "basic idea that feelings are largely a collection of body-state changes", and this is James's seminal contribution to the subject (Damasio, 1999: 288).

Given these premises, one might suppose that the so-called *mind-body debate*, typical of the current neuropsychological and philosophical controversy, could also represent a kind of anchorage for tourism studies, given that the tourist experience has been generally accepted and examined as necessarily *embodied* for over ten years. In fact, embodiment can be seen in recent decades as an archipelago of tourism studies with various, generally large islands or aggregations of islands, without any specific post-cartesian tendencies. The recently-founded Tourism and Embodiment Research Group (ATLAS, 2011) testifies to the need for reconnaissance and for a global vision, promoting contact between social disciplines and research areas.

A few considerations are necessary at this point. It should be noted that the marketing of tourism has always played on its sensuous aspects, while tourism theories have always been extremely abstract. An important stage in current research, however, was a provocative essay by Vejiola and Jokinen (1994) who put the question of the body at the center of tourism studies. Thanks to the feminist slant of their work, the Finnish authors were also acknowledged by Margaret Swain in a special issue of the 'Annals of Tourism Research' dedicated to gender in tourism (Swain, 1995). From that moment, the importance of the body in tourism research

has been irreversible. *Tourism and Gender: Embodiment, Sensuality and Experience*, edited by Pritchard, Morgan and Ateljevic (2007), witnesses the development of a trend where there is confirmation of the close consideration of gender studies and diverse anthropological approaches, to the extent that it can now be defined as mainstream.

Within the embodiment framework, however, other trends have been developing with regards tourism studies. It is not surprising that alongside the triumph of the tourist gaze (Urry, 1990) there has also been explicit explorations of the other senses; Dann and Jacobsen (2002), for example, not only stress the importance of the sense of smell, but also emphasize the tourist's polysensual completeness. With rather practical considerations in mind, the importance of the various senses has recently been explored within the framework of social tourism, that is, for people with disabilities (Richards, Pritchard and Morgan, 2010)<sup>iv</sup>.

Concluding this brief review, we have the impression that, while there has been general talk of embodiment, it is, with some exceptions, mostly an *apparent* encounter, without a specific convergence of tourism studies with neuroscience or scientific disciplines. To a large extent the body has remained an epistemological challenge where current perspectives of neuroscience could, and should, be taken into account.

## QUALIA

The debate regarding so-called *qualia* should also be located within our framework, although at first sight it appears to be an extremely philosophical and specialized discourse, a far cry from the field of tourism studies. In actual fact it is a general topic, laden with implications, as it deals with the phenomenological and/or qualitative categories of consciousness and the conscious subject, and hence is strictly interlinked with the tourist experience.

On the contemporary scene, distinct positions are held by various philosophers and neuroscientists, contributing to a broad configuration of "cartographies of the mind"<sup>v</sup>. If we take the issue of *qualia* as a kind of litmus test, then among the most radical attitudes is that known as materialism or eliminative materialism. In this respect, the Canadian-American philosopher Patricia M. Churchland is interested in the relationship between neuroscience and philosophy, and aims at the complete assimilation of the mind into the brain (Churchland, 2002). She is, of course, against approaches and concepts such as *consciousness* and *qualia*.

One of the most significant recent theories in our opinion is the neural darwinism of the American Nobel prize-winner Gerald Edelman, which consists of an extremely flexible and structured evolutionary perspective, open to the so-called higher-order consciousness and to *qualia*. Edelman's views have been popularized in works like *Wider than the Sky* (Edelman, 2004) and *Second Nature* (Edelman, 2006).

According to Edelman's evolutionary neural theory, the hypothesis of *qualia* is connected to higher-order consciousness. In fact a distinction should be made between primary consciousness and higher-order consciousness, or "the capability to be conscious of being conscious. This capacity is present in animals with semantic abilities (chimpanzees) or linguistic abilities (humans), and those with linguistic abilities are also able to have a social concept of the self and concepts of past and future" (Edelman, 2004: 161-162). The problem of *qualia* is also dealt with in *A Universe of Consciousness* (Edelman and Tononi, 2000) in what is considered as one of the book's most demanding chapters.

The Italian neuropsychologist Oliverio also gives useful examples, wondering if it is possible to reduce "phenomenological or qualitative categories (the *qualia*, that is experiences or sensations like feeling pain, looking at red wine, tasting an ice cream) to neuroscientific events or to information processing" (Oliverio, 1999: 166-167). He answers of course in the negative.

Human existence itself is inconceivable without *qualia*. This becomes an even more valid proposition when considering an increasingly experiential branch of tourism which has superseded and incorporated the stage of exclusive *sightseeing* and concentrates completely on all five senses: for example in areas like food and wine tourism as well as all forms of enjoyment linked with *wellness*, where the olfactory, taste (gustative), auditory and tactile components are fundamental, as partly anticipated in the section on embodiment.

## EXTENDED MIND

The first decade of the new millennium has been very productive from various viewpoints regarding the *mind-body debate*, particularly in ways which might also relate to tourism. In their seminal article *Extended Mind*, Clark and Chalmers (1998)<sup>vi</sup> had focused on the fundamental relevance of environmental, and, generally speaking, spatial aspects in mostly cognitive terms. This framework implied an externalized, fairly widespread subjectivity. In their proposal of an *active externalism*, the

world presents itself as part of the cognitive process: in a nutshell, the question raised is, “Where does our mind stop and the rest of the world begin?”

A book edited over a decade later (Menary, 2010) contains both the original 1998 text and a presentation of the subsequent debate, including proposals of different views. However, it is clear that after the long supremacy of rationalist and positivistic attitudes with the emphasis on cold cognitive processes, embodiment, with its accompanying feelings and emotions, is now taken for granted. A neuroscientific perspective is also included, which in some ways goes beyond its frontiers, towards the writing system, and, implicitly, also the much-debated issue of second orality (Ong, 1982; Dehaene, 2009).

Within the framework of these second-wave cognitive-integration-style arguments, bodily physical manipulations of external vehicles are explained as different, but complementary to internal processes (Menary, 2010; Sutton, 2010).

The proposal advanced by Menary, who agrees with other authors, seems correct. He distinguishes processes requiring internal manipulation from processes requiring external manipulation, such as those set up through the writing system, which in a sense go beyond the neural system: “Stable and enduring external written sentences allow for manipulations, transformations, re-orderings, comparisons, and deletion of text that are not available to neural processes” (Menary, 2010: 240)<sup>vii</sup>.

Concerning embodiment, it is interesting that new performances are continually being established, especially those gestures linked to the new way of touching screens which particularly apply when using iPads and iPhones rather than traditional computers. This fact determines novel associations and probably represents, in an evolutionary view, an unpredictable factor in the development of both brain and mind.

Some aspects of the old question of technologies, considered by the German philosophical anthropologist Gehlen in his interpretation of culture as human prostheses (Gehlen 1984), can be seen today, reflected in the controversial term of the ‘extended mind’. What is more, augmented reality (AR), which has apparently superseded virtual reality (VR), can be considered within this framework; its relevance is particularly evident in leisure and tourism, due also, for example, to the potential of GPS (Global Positioning System). The information about the real world surrounding the user becomes interactive and digitally manipulable; we need only think of solid state compasses and the various instruments with displays which allow us to explore a city and its hotels, restaurants etc.

Of course, not all facets of the problem can be clarified in these brief notes; indeed, contradictory issues remain as far as spatial and sensory-motor aspects are concerned owing to the specific nature of the tourist experience, which should be understood as a particular case of *extended experience*. Nevertheless, in our view the possible dangers implicit in some extended mind attitudes are eliminated if we agree that accepting the extension of the cognitive embodied process does not mean ignoring the specificity of the 'I', in the sense of the unity and uniqueness of the mind which has to be preserved<sup>viii</sup>. As an Italian neuropsychologist has commented, "It is in the uniqueness of the mind, due to an interaction between genetic and environmental factors, that the roots of the 'I' are plunged" (Oliverio, 2008a: 109)<sup>ix</sup>. This is also valid for tourism studies.

## MIRROR NEURONS

A brief section should also be devoted to mirror neurons, which were discovered in Italy in 1996 (Rizzolatti et al, 1996, Rizzolatti and Craighero, 2004), perhaps one of the most significant scientific discoveries of recent decades. It was found that mirror neurons "fire" (become active) in the frontal lobes of macaques not only when the monkeys perform a certain task, but also when they watch someone else perform the same task. There is evidence that a similar system exists in humans, although this has yet to be proved conclusively. The consequences of such synchrony between action and observation are incalculable; according to the Indian neuroscientist Ramachandran, mirror neurons could even be for psychology what DNA has been for biology. In all probability they will pave the way towards a new theory of the mind and open up unexpected new horizons (Ramachandran, 2000). For example, regarding the general problem of the gap between biology and culture, it has been suggested that the very existence of mirror neurons might represent a kind of bridge between these two dimensions (Di Francesco, 2008).

Research revealing the explanatory potential of mirror neurons in imitation, empathy, language and many aspects of our social life has also been of the utmost importance (Iacoboni, 2005; 2009). In fact mirror neurons underpin a functional mechanism (embodied simulation), which can explain within a unitary neurophysiological framework important aspects of human social cognition and action. It would be even impossible to interact without them, because we would be blind to the actions, intentions and emotions of others.

In their popular work *Nella mente degli altri* [In the Mind of Others], Rizzolatti and Vozza (2008: 65-68) choose the utterance “I feel your disgust, I identify with your pain” as the title of a brief chapter devoted to the physiological basis of empathy, one of the key issues accompanying the mirror neuron hypothesis. Not only does a generic neurophysiological organization allow us to understand the emotions of others, experiencing them in our inner self, but they also constitute an advanced net of sophisticated brain mechanisms located in different areas of the cortex. The social consequences are incalculable as the process can embrace fields which range from advertising to culture, to politics and even neuroethics. Researchers such as Boella are particularly interested in the mechanisms of empathy from a neuroethical viewpoint, and go even beyond mirror neurons (Boella, 2008: 96-104).

With the specific issue of the tourist experience in mind, mirror neurons could contribute to explaining some essential aspects of tourism, i.e. so-called imaginary, social representations, group dynamics and the gregarious spirit still typical of mass tourism despite a growing individualism.

Some scholars, in particular the Italian Gallese (2008), extend the range of mirror neurons to language mechanisms; indeed, an alliance has been established between Italian neuroscience and Californian cognitive semantics, and radical conclusions have been suggested, regarding actual concepts and the theory of understanding. In fact, as Gallese and Lakoff argue, language makes direct use of the same brain structures which are used in perception and action (Gallese and Lakoff, 2005); in this framework, language, far from being abstract and symbolic, is decidedly multimodal and embodied.

For this reason, remarkable consequences could also emerge from investigations into the tourist experience. Concepts present themselves, both rich and embodied; to suggest just one reflection based on a simple example, we might take the idea of a tourist destination like San Francisco. This concept presents as deeply embodied in its neuropsychological context, where many modalities are linked (sight, hearing, touch, motor action and so on), due to the fact that language exploits a ‘multimodal’ sensory-motor system which also involves unexpected areas of the brain.

## **NEUROETHICS**

Neuroethics is a very recent field of research connected with the progress of neuroscience, and is based on the assumption of the neural

basis of moral choices which are increasingly verifiable experimentally through *brain imaging*. Neuroethics is located at the interface of neuroscience and moral philosophy, psychology, sociology, pedagogy and law, and this research on the brain has revealed unexpected behavior.

An extremely lively international debate is taking place, with explicative titles produced, such as Michael Gazzaniga's *The Ethical Brain* (2005), Marc Hauser's *Moral Minds. How Nature Designed our Universal Sense of Right and Wrong* (2006), Laura Boella's *Neuroetica. La morale prima della morale [Neuroethics. Moral before Moral]* (2008), Benjamin Libet's *Mind Time. The Temporal Factor in Consciousness* (2004) and Michele Di Francesco's *Neurofilosofia, naturalismo e statuto dei giudizi morali [Neurophilosophy, Naturalism and the Statute of Moral Judgments]* (2007a).

In fact the reorganization of the role of consciousness and self-consciousness which has emerged from this research, is disconcerting, especially as experiments conducted with the help of *neuroimaging* have evidenced a whole range of cerebral activities of which the subject was unaware. Therefore, the issue can even be seen in the terms of "What is my brain doing, while I (apparently) decide?" If, on the one hand, the traditional problem of *free will* is raised, on the other hand there is even talk of *zombies* living within us (Di Francesco 2007a: 131).

In this case too, several positions can naturally be identified, ranging from one inspired by radical naturalism, according to which the mind is the last to know what the brain is doing, to other more moderate stances (e.g. Di Francesco, 2007a).

The so-called *trolley dilemma* involving moral choices is a topic which might seem rather distant from our interests in tourism studies. This is a mental experiment where subjects are asked to imagine the following situations: a) stopping an out-of-control trolley which will run over five people unless you pull a lever to deviate its trajectory, but at the cost of one person's life; b) stopping the trolley in the same scenario, but where you need to push one person under its wheels. After a great amount of experiments, the results obtained provide a kind of universal basis for moral judgments. For the majority of the numerous people interviewed in various countries, a), that is, indirect action seems morally legitimate, while b), direct action, that is, directly pushing someone to their death<sup>x</sup>, is disapproved.

There have been no specific studies linking neuroethics with tourism up to now, but it is likely that tourism studies will sooner or later be affected in some way, especially as the ethics of tourism has been a much-

debated topic since the Eighties, and has been officially codified in an extremely ambitious UNWTO document, the *Global Code of Ethics for Tourism* (1999). Furthermore, over the last decade an increasing number of different formulations of ethical problems in tourism have been advanced, from Lanfant (2004), to Macbeth (2005), Smith (2009) and MacCannell (2011).

The difference between direct and indirect action can probably be assumed to be a division regarding moral responsibility. In fact, there is a whole range of behavior between, for example, sex tourism, where the direct immoral action is condemned, and cases of international and domestic mass tourism, which are generally seen as something distant and not involving any serious moral responsibility. Moreover, a neuronal concept of responsibility could not only be applied at the theoretical level to the conceptualization of responsible tourism, but also to many practical cases of the tourist experience.

As far as future investigations are concerned, other new paths could be identified, e.g. related to a renewed concept of empathy which could characterize the traditional anthropological host-guest relationship. Other more general suggestions might concern tourism and wellness, as well as seeing the tourist experience as neuroenhancement.

## **NEUROIMAGING: IN PLACE OF A CONCLUSION**

Scientific evidence, a tangible confirmation of neuroscience, is provided by *neuroimaging* or *brain imaging*. Functional Magnetic Resonance Imaging (fMRI) is a specialized type of MRI scan which measures the hemodynamic response (i.e. the change in blood flow) relating to neural activity in the brain or spinal cord of humans or other animals. Compared to TAC and PET scans, fMRI is noninvasive and has contributed to creating a cartography of the brain, evidencing the main areas involved in any given function, especially those areas of the cortex which become active in motor functions, in language, decision-making, memory and moral choices. For example, the movement of a hand is linked to increased activity of the brain cortex, while an emotion is linked to a more intensive activity of the limbic system, all evidenced through graphic chromatism (Oliverio, 2008c).

The consequences of these experiments are incalculable. Thanks to their ongoing popularization, many of us laymen are agreeably surprised on an almost daily basis to see the bright images of single areas of the brain reproduced in even the general, non-specialized press. Of course, any sense of euphoria in 'reading' the brain (and mind) should be

mitigated by a more basic consideration of these ambivalent contributions, by considering the danger inherent in a merely physicalist interpretation of the human mind (Oliverio, 2008a: 33).

For now we must concede that there is no apparent or immediate spin-off in the field of tourism studies, as fMRI needs to be conducted in a laboratory and is still quite expensive. Although we can imagine its use in tourism marketing, it is claimed that even if the conditions for experiments were available (an unlikely situation) we would have to take into consideration the complexity of the tourist experience and the limited localization and artificiality of the laboratory experiment (Boella, 2008: 29, 37).

Nonetheless, tourism studies must keep a close watch on new research methods and results; future research could be based on results already obtained from fMRIs, possibly in combination with other methodologies. Indeed, tourism studies are meant to be open to various disciplines: it is thus now impossible to ignore the interdisciplinary openings offered by these images of the human mind and by neuroscience in general.

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<sup>i</sup>This article was presented at the XVII Congress of the International Sociological Association, Research Committee 50 on International Tourism in Gothenburg (July 2010) in a less elaborate form. A certain openness regarding the issue of neuroscience has characterized the ISA RC50 for several years. Already at the XIV ISA Congress in Montreal in 1998, the President Marie-Françoise Lanfant proposed a session on the theme 'New Sciences and High Technology in Tourism Research and Praxis. Mobility and the New Sciences', chaired by Liebman Parrinello. Part of her contribution was published under the title *The Technological Body in Tourism Research and Praxis* (2001). Later, at the RC50 interim symposium 'Understanding Tourism. Theoretical Advances' held at the Aegean University of Mytiline (14-16 May 2004), the importance of the link between neuroscience and the tourism experience was highlighted by the present writer under the title *Mind, Body and the Tourist Experience* (Liebman Parrinello, 2004).

<sup>ii</sup> According to Gardner's so-called cognitive hexagon, there are six main cognitive disciplines: philosophy, psychology, artificial intelligence, linguistics, anthropology and neuroscience (Gardner, 1987). Since then, neuroscience has undergone an enormous process of growth.

<sup>iii</sup> See e.g. Rodrigues, Correia and Kozak (2011) *A Multidisciplinary Approach on Destination Image Construct*.

<sup>iv</sup> For a more philosophical view, see Liebman Parrinello and Wang. The former (2001; 2008) considers the tourist's technological body in an evolutionary way; Wang (2008) follows Bourdieu in his philosophical approach in distinguishing four types of body-fields.

<sup>v</sup> See Marraffa, M. (2007) *Cartographies of the Mind*.

<sup>vi</sup> Cf. also A. Clark's (1997) significantly titled *Being There: Putting Brain, Body and World Together Again*.

<sup>vii</sup> Certainly, one could object that the writing system, which was not so evident in handwriting, is now also subject to an overtly coercive conditioning, a pattern, a grid. Moreover it is something closely related to globalized patterns: the obligatory Word computer document system, the prevailing Times New Roman font.

<sup>viii</sup> See Di Francesco, 2007b.

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<sup>ix</sup> See also by the same author, *Geografia della mente. Territori cerebrali e comportamenti umani.*[*Mind Geography. Brain Territories and Human Behaviors* (2008b).

<sup>x</sup>This issue is summarized and explained in more detail in Di Francesco, 2007a: 133-134