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Original Paper

Neuroscience & cultural psychiatry – Part I
A biopsychocultural framework for spirituality

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Abstract. *This paper is aimed at analysing and contributing to an epistemological synergy between Neurosciences and Cultural Psychiatry. As both neuroscience and cultural psychiatry have addressed their attention to the study of consciousness, it is now possible to put these useful data to work by interweaving the framework of consciousness into the study of those specific states of consciousness that go under the label of spirituality.*

Keywords: Spirituality, neuroscience, cultural psychiatry.

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"Are quanta, that is the 'objective' world, and qualia, that is 'subjective' sensation, of an actually different nature, like dualist states, or are we incapable of catching their inherent unity?"
(Crocchiolo, 2007)

THE ASTONISHING HYPOTHESIS Consequently to the progress made by Neurosciences in the study of consciousness, a "Copernican" movement arose to solve the problem of how neural matter translates into a psychic experience (Edelman, 1992; Edelman & Tononi, 2000; Damasio, 1994; Solms & Turnbull, 2002; Richerson & Boyd, 2005; Siegel, 1999; Ridley, 2003).
One of the most meaningful works on this issue is titled "*A Framework for Consciousness*" (Crick & Koch, 2003), which describes the methodology used by Neuroscience in facing the hard task of providing a plausible explanation to how sensations arise from the brain.
Just like Kandell (2006) adopted the method of "one cell at a time" in order to clarify the processes involved in the shaping of *Aplysia* nervous cells, Crick and Koch similarly started their study of consciousness and set the limits of their research by selecting the "*neuronal correlates of (visual) consciousness in terms of competing cellular assemblies*". Starting from the brain reset consequent to visual inputs, the Authors faced a more general question: How do the qualia of redness, the painfulness of pain, take a meaningful shape for the person experiencing them?
At the end of their paper the Authors, mindful of the practical reductionism of their method, suggested to interweave the data drawn from neuroscience within an interdisciplinary framework of interpretation in order to obtain a coherent scheme for the functioning of the Central Nervous System in philosophical, psychological and neural terms.

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In this paper, Cultural Psychiatry accepts the challenge while being fully aware that the state of the art of psychiatry can only provide a methodological framework with which to analyse how consciousness, and in our case spirituality, arises from the mind.
In outlining the framework for spirituality, I only suggest an investigative approach to spirituality by taking it as a scientific problem rather than as a theological dogma.
Thanks to the publication of *The Astonishing Hypothesis: the scientific search for the soul* (Crick, 1995), expunging the soul from its theological derivation became the "natural" result of a lay research methodology that substituted the dogma of a *creation of something out of nothing* with an evolutionary birth of any kind of consciousness shaped by neuronal "*brute facts*" (Koch, 2004).

CONSCIOUSNESS When it comes to defining the Western conception of the states of consciousness, Neuroscience and Psychiatry walk hand in hand since consciousness is consensually defined as belonging to two main categories: *primary consciousness* and *superior consciousness*.

Neuroscience

Edelman and Tononi (2000) classify consciousness in: *primary consciousness*, which is also attributable to animals, is "*the capacity to generate a mental scenario*" from sensorial perceptions in order to adequately respond to a stimulus occurring in the present time, and *superior (higher) consciousness*, characterized by "*a sense of self and the capacity, whilst in a state of alertness, to explicitly build and connect past and future scenarios*" .
In order to achieve the latter state, which is specific to the human species, an extremely complex and diversified neuronal activity is required: "*The manifestation of a certain state of consciousness is immensely informative, as it entails the exclusion of, or the choice between, billions and billions of other states of consciousness, each of which can have different consequences*" (Edelman & Tononi, 2000).

Psychiatry

A correct psychological definition of the "normal" superior state of consciousness is still broad and multidimensional.
Ey, Bernard and Brisset (1988) defined "*the field of consciousness as the organization of the current sensitive experience which integrates its presence into the world*". This definition underlines the concept of consciousness as a cross-section of our psychic life at a given point in time.
According to Scharfetter (1992), the average state of vigilant consciousness is a "*sharing, a common image of the world in which a person belonging to our culture lives*". Scharfetter hence highlights the pragmatic cultural relativity of the state of consciousness, according to how it is described or felt in the wide variety of cultures in which an individual lives. It is worth noticing that, beside the *superior consciousness*, there is a widely recognized particular kind of consciousness, which Scharfetter calls "*cosmic, divine supra-consciousness*" in which "*the spirit is utterly clear, active and concentrated*". This state of consciousness is often correlated to "*deep meditation, religious ecstasy and transcendence experience*".

Transcultural Psychiatry

In the section entitled *Psychophysiological Experiences* of Kleinman's seminal book *Rethinking Psychiatry* (1988) the Author underlines that individuals in Western societies suffer from a dissociation of sensibility which leads them to simultaneously experience being a body and having a body.
In order to accomplish this premise, the rationalizing attitudes of Western culture have embodied in the brain a *metaself*, a permanent state of meta-consciousness in which a critical observer watches and comments on the experience. In the course of time, this metaself has been reproduced into specific culture-related identities which parallel the cultural split between mundane and extramundane beliefs.
Following this individual and cultural climate, a large number of individuals enact a variety of transcendence techniques that trigger psychobiological mechanisms which, in turn, facilitate the appearance of special states of consciousness usually described as mystical states or religious trance,

aimed at trying to bridge this split through a reunion with the lost Absolute; a maneuver perceived as pleasure-provoking (Prince, 1970; 1982; Bartocci, 2000; Wulff, 1991).
When endorsed by social approval, these kinds of altered states of consciousness are validated as permanent cultural beliefs, thus connecting said experiences with a supernatural force, energy and external locus of control (Bartocci & Littlewood, 2004; Littlewood & Bartocci, 2005; Pappas *et al*, 2007). In brief, in Western cultures, we have two distinct approaches to explain differences in states of consciousness:

a. MEDICAL: all meanings and associations are brain and culture-related products. All perceptual processes are elaborated through interpretation and abstraction strategies, according to subjective cultural memories, until the percept is understood as a sensation that can then be expressed through communication (Hinton *et al*, 2008a; 2008b)
b. THEOLOGICAL: On the contrary, the spiritual seeker awaits extramundane inspiration or struggles to reinforce a divine-made state of consciousness and believes he is God-blessed to share an event that is hierarchically superior compared to all the others. The notion of spirituality is an extraordinary common path uniting God and human beings.

SPIRITUALITY The difficulty of elaborating a biopsychocultural definition of a standard state of consciousness, parallels the effective difficulty in finding a globally acceptable, non-theological, definition of spirituality.
While religions are culture-bound systems, based on a large bulk of literature which describes their liturgy and their formal characteristics providing a definitive model for the faithful, a definition of spirituality in psychological terms is more difficult, as spirituality is more elusive and varied in meaning, both historically and culturally.
Dein (2005) suggests three main ways in which the term spirituality is used worldwide:

1. a relationship with (and often a devotion to) a higher power;
2. a search for meanings through this relatedness;
3. an animating and vital principle within the person.

Favazza (2009) regards spirituality as *a meaningfully interpreted altered state of consciousness with a very wide range of intensity*. It may be experienced in both religious and secular contexts. In order to point out spiritual nuances of meaning Raymond Prince, in his lecture: *Must the Spiritual Self Always Involve the Supernatural? The Confucian example* (presented at the 1st World Congress of Cultural Psychiatry, 2006 Beijing), delved into Confucius spirituality and the supernatural in an intriguing way: he affirmed that China's most revered wiseman should be regarded as "spiritual' in spite of his obvious lack of interest in the supernatural. But, at the same time, Prince underlined that Confucian philosophical spirituality is different from the theological spirituality of the West. As an example of anthropologically centred spirituality, Prince quoted this saying by Confucius Analects: "*In the practice of archery we have something resembling the principle in a moral man's life. When the archer misses the centre of the target, he turns round and seeks the cause of his failure* within himself". The demarcation line between experiences felt to be mundane or extramundane depends on connecting life events to inner elements within himself or outside in the supra-nature realm. Once life events are connected to the divine dimension it will configure entirely different scenarios.

Bartocci and Prince (1998) outlined the research work of the *Italian Institute of Transcultural Mental Health* on the religious phenomenon, underscoring the ease with which a subject undergoing existential difficulties experiences a sensation of *fascination*, thereby feeling a dependency on a hyper-intentionality in the external world that can be interpreted in terms of magic, religiousness or spiritualism, depending on the existing cultural conditions. In De Martino's view (1980), in not westernized populations, magic was the instrument with which to protect oneself against the sense of nothingness, a way of neutralizing the '*crisis of presence*'. Since magic had the limit of lacking the complex cultural institutionalization offered by well-organized Churches, it was relegated as an obsolete pre-logic feature of traditional

people and then replaced with the Western religious concept of Holy Vital Force (Freeman, 2005). By paraphrasing De Martino's statement within the context of physics, i.e. that magic is to religion what an abacus is to a computer, we could certainly say that both fireworks and nuclear explosions produce light, thunder, and subsequently awe, wonder, fear and hope, despite of the abysmal difference in which each one of these physical and psychological processes takes place.

ABANDON OR MAINTAIN THE SUPERIOR STATE OF CONSCIOUSNESS?

"(I often wonder whether this abandon [of superior consciousness] is what some mystics are looking for)"
(Edelman, 1992, brackets in the original)

Alongside Edelman's above statement, his text also contains another serious warning that attracts the attention of clinicians and of theoreticians alike: "*one can't let go of superior consciousness without losing the descriptive skills that it enables*" (Edelman, 1992). When this superior consciousness tends to take the shape of cosmic, divine supra-consciousness one risks losing the critical capacity of superior consciousness, thereby deactivating the "*model of interaction between the self and non-self*" (Edelman, 1993).
Whereas, for a neuroscientist, the *non-self* is a functional part of the brain that is incapable of operating "*the recognition of a subject-predicate relationship*", for a psychiatrist the *non-self* falls within the scope of dissociative dynamics. Under this point of view the intentional obstinacy of spiritual seekers to find oneness with the Absolute may be considered as an attempt to overcome a floating feeling of dissociation and to try and regain the internal unity made to disappear by the complete acceptance of the cultural religious double register to see the world.
However, a negative side-effect of spiritual seekers' transcendence operations is to consolidate extreme techniques that eliminate the subject-predicate relationship, thus equating one's self to God. The formula "*You are I and I am You*", the theoretical paradigm set forth by St. Angela of Foligno (1248-1309), synthesizes the essence of spiritual sublimation.
The theoretical body of knowledge possessed by Greek Philosophers: "*a conscious training of their psychic powers through abstinence and spiritual exercises*" (Dodds, 1951) developed transcendent attitudes into a deep religious sense and succeeded in proposing an effective spiritual "language" that, by virtue of its emotion-capturing simplicity, prevailed as the communicative repertoire that has never abandoned us since.

A reasonable way for Western medical sciences to see spirituality is to regard it as a set of biopsychocultural inputs processed by a multitude of events. It is preferable to leave the panorama influencing the brain as wide-open as possible since the external "spiritual object" to be perceived does not physically exist, which implies that the cause-effect, quanta-qualia connection lapses. The only thing we are left with is a number of human beings that claim they have experienced ecstasy, inspired revelation, spirituality, a number of literature, frescoes, paintings, churches that manage spirituality according to religious rules and interpersonal acted-out religious behaviors: these, thus, become the external "objects" we have to deal with. The theoretical disconnection of spirituality from a narrow "sensory-stimulus / quanta-qualia" process spurs us to investigate the comprehensive functioning of the cultural brain and to consider spirituality as the result of billions of neuronal facts and neuronal connections managed by a vast experiential conditioning.
Even if in literature we find accurate descriptions of a large variety of mystic and ecstatic states and apperceptions of the divine and consequent sudden religious conversions as *Quantum Changes, Spiritual Transformations* or *Spiritual Evolution* (Miller & C'de Baca, 2001; Vaillant, 2008; Koss-Chioino & Hefner, 2006), these phenomena have been explained through an apology of the sacredness and of the divine on the basis of psychologized forms of language (Allègre, 1997; Boncinelli & Sciarretta, 2005; Dennet, 2006).

In conclusion, unless spirituality is clothed with the religious categories which depict it with their specific cognitive traits according to single cultural environments, it remains very difficult to describe. For the time being, it is plausible to make do with a definition of spirituality as a suspended state of consciousness or, better still, as a *spirituality-oriented consciousness* (**Note 1**).

FILLING-IN EXPLAINS MIRACLES

"How does the brain know what neuronal firing represents?"
(Crick & Koch, 2003)

The scholar of cultural psychiatry will increasingly have to answer the following crucial and pragmatic question first asked by Vernant (1979) "*To what extent did ancient Greeks recognize an order of reality corresponding to what we call image, imagination, imagery?*" In our case the question is: to what extent do present-day cultural brains recognize an order of reality corresponding to what comes from that kind of agency we call God? In order to focus the study on the "reality" of imagery Vernant (1979) has pointed out four different categories of phenomena inherent to the apparition (and eventual enactment into cultural beliefs) of images: the art of actors to stimulate images (*phanthasiai*); the apparition of images in dreams (*onar*); the apparition of the ghost of a deceased (*psyche*); the apparition of entities connected to a divinity (*phasma*). The category that interests us most in this paper is the one of *phasma*, precisely because it relates to an extra-mundane apparition in the fullest sense of the term: the apparition of God (**Note 2**).

In order to explain the brain's craftsmanship in composing the notion of God and the possibility of making the nameless and "imagineless" God give shape to a meaningful apparition, it is useful to rely on the brain's recognized potential to unconsciously recompose perceptions, stimuli, symbols and intuitions, converting them into images through a process connecting proto-images (and proto-meanings) named by Crick and Koch (2003): *filling-in*. The *filling-in process* explains how experiential units of consciousness (different on respect to qualia, which are rather peremptory, as they are accepted by the brain as such: "here is the redness of red!") construct a complex sensation with an accomplished sense for that given person in that particular culture. While neuroscience has investigated in depth the particular production of a single bit of qualia from each neural quantum, conversely the production of a meaningful image and thought needs further study insofar as it is grounded on a complex process aimed at organizing and integrating many floating qualia into an actually perceived experience. It could be said that the apparition of a specific religious experience requires a "reincarnation" process, meaning thereby a meaningful re-materialization from a floating and undifferentiated numenic realm.
When there is an insufficient amount of visual information, the cortical networks "fill-in" the incomplete interpretation from the external environment, so as to provide significant correlations in their inputs: "*In other words, the brain is very good at detecting apparent causation*", "*Such filling-in is likely to happen in many places in the brain*" until it is led to "*jumping to conclusions*" (Crick & Koch, 2003).
The function of introducing a meaningful input from a locus that is "external" to the limited number of neurons working to elaborate the stimulus coming from a physical perception (Filling-in is not based on information coming from that specific object-percept) within a still amorphous container, is different from the thus-far described "rough" and direct perceptual function of specific extra-cranial stimulation. In the intra-cranial filling-in process, groups of neurons that are not stimulated from the external physical world, are activated by the brain in a way that is aimed at the reconstruction of a whole and meaningful image.

What triggers the mechanism of filling-in is the incompleteness of the image as it is being formed: suddenly, the complete image apparently appears out of nothing like a *deus ex machina*. This apparition of a meaningful imagine or a meaningful thought is in no way miraculous although the subject does not know who or what pushed him to locate in a still amorphous container a number of not-yet-

cognitive contents (unconscious memories, past affective floating experiences, etc.) until they finally give way to the appearance of meaning.
Although the demiurge or the orchestra conductor who conducts the filling-in process remains in the dark, his orchestra, comprising the intertwining of specific environmental perceptions, interbreeding of cultural values and inter-human experiences that are treasured within the brain, most often produces magnificent images and emotions, and also illusions, hallucinations and delusions once we accept (Ballerini, 1996) that the notion and the experience of "truth", as sudden revelation of essence, is compatible with the definition of delusional experience.

THE ZOMBIE MODE OF CONSCIOUSNESS IS A CULTURAL MODE OF PRODUCING IMAGES

The filling-in process has a flip side. Once the influence of standardized *memes* (Blackmore, 1999; Dawkins, 2006) is endorsed by interpersonal/cultural/sensorial conditionings, the modalities of filling-in are modified. When the variety of experiences acceptable for a given social context or when cultural messages are funneled into only a few dogmatic rules, the creativity of the filling-in process is reduced insofar as the uniformity of the messages coming from that cultural context produce a sort of *ossification* of the neural network in the brain, making it inflexible.
If we accept that "*By the habitual act of thinking in a particular language, or believing in the form of a particular religion, those thoughts assume a type of physical reality in the organization of neural networks in the brain*" (Tseng, 2001), it thence becomes plausible that the modifications in the organization of neural networks are reinforced if the messages that produced them are repeatedly re-iterated. The catechistic repetition of the same message, whatever this may be, consacrates the filling-in process and prevents the intervention of innovative actions.
The epigenetic influence of the environmental context on the filling-in process leads to changing the definition of the very process, which neuroscientists have eerily called the "Zombie mode of consciousness". This definition was chosen because the filling-in process was considered to be an automatic process and viewed as an evolutionary advantage that makes it possible to respond to sensory inputs in a rapid, transient, stereotyped and unconscious way: a sort of reflex that is much faster than slower cognitive systems that need time to think and plan more complex behaviours (**Note 3**). In order to avoid getting trapped in the Frankenstein-like figure of the zombie, it would appear advisable to move from a genotypic zombie mode of consciousness to a more artistic and harmonic culture-related epigenetic mode of experiencing and representing the world through an ever-changing filling-in process. Indeed, this approach offers a great advantage: if we learn to consider filling-in as a by-product of historically and culturally shaped experiences, it becomes possible to locate the figure of the orchestra conductor within the billions of sensations treasured by individuals during their lives, thus attributing the responsibility of human thoughts and behavior to men and not to an external locus of control (Girotto *et al*, 2008).
With due respect for all the supporters of "*God's point of view*", according to who it is deemed possible to transfer knowledge as such to a hypothetical animal lacking it, this approach is neither plausible nor compatible with the image-building processes described by neuroscience (Edelman, 1993).

BIO-PSYCHO-CULTURAL OR CULTURE-PSYCHO-BIOLOGICAL SPIRITUALITY?

> *" […] the independent soul exists, although it is necessary to accept that it is mortal"*
>
> (Schiffer, 2008)

When in 1979 Raymond Prince, in his paper "*Religious Experience and Psychosis*", discussed the fact that both religious experience and psychosis could be seen as ways of adapting to stressful life events (Batson & Ventis, 1982), neuroscience had not yet highlighted the brain's ability to construct a neural

network capable of organizing epigenetic and relativistic districts in order to experience and to act in the world.
Cultural Psychiatry has instead investigated in depth the variety of "normal" local representations and/or "pathological" delusions depending on the religious background of different countries (Tseng, 2001) and indicated some of the psychodynamic antecedents in the construction of "beyond" the superior state of consciousness. The attitude to delete the awareness from the immediate experience of events (Bartocci & Dein, 2005; Littlewood, 2001; Favazza, 2009) has been pointed out as an *apophatic* technique to experience cosmic supra-consciousness, to approach the Absolute and to feel at oneness with the world.
It is unarguable that the superior consciousness, as described in neuroscience, denotes an extraordinary capacity to create realistic and equally fictitious scenarios that enable a wide variety of inter-human actions and relations. The art of an actor to create images, the skill of a parent who creates marvels by telling extremely entertaining stories to his/her children, the evangelization of "pre-logic pagans" by eliciting a long series of contacts with God, the faith on healing through miracles, the ecstasy to experience having a soul and not only a body, are all based on the centrality of the *sentiment of transcendence.*
In order to succeed to give meaning to the spin-off from the *sentiment of transcendence* into the *sentiment of freedom* and finally into the *sentiment of deity* (Rovera, 2010) and achieve the objective of considering divine images, religious beliefs and the ineffable spiritual dimension not a divine gift or an unexpected result of childish fictitious games aimed to enact what is felt as pleasant (**Note 4**) but a specific, historically determined process within the evolutionistic mind, it is likely to endow ourselves with an exceptional capacity to carefully interlink the biological, psychic and cultural roots of *homo religious* and hopefully to arrive to the conclusion that: "*The religious phenomenon has the status of an ordinary object of knowledge, accessible to scientific research like any other*" (Vernant, 1982).

NOTES

1. In order to facilitate the study of the spiritual dimension, it is necessary to bridge the epistemological gap between theology, which depicts spirituality as sine substrato and neuroscience, which endows it with a biological substrate. The "cosmic knot" accommodating the mystery of the onset of *logos* "out of nothing", which theology single-handedly solves through the introduction of the notion of soul or spirit, can be at least loosened by the use of a language that can appropriately name the transition from quanta to qualia with the well-known term of transcendence. The first meaning given to the term Trascend by the Collins Dictionary: "to exist beyond (the material world)" is of no use in a medical perspective because it denies the existence of a substrate underlying intentional actions. The second meaning, "to go above or beyond (a limit, expectation, etc.)" is instead appropriate insofar as it indicates a transition from a limit or expectation to the next and correlates to a pragmatic epistemological panorama: "beyond our experience of phenomena, although not beyond potential knowledge".
2. The apparition of *psyche* is different from *phasma* because the former is the apparition of a sort of duplicate of a human being, who has materially and psychically been living.
3. *Latah* is an example of an acted out zombie mode of consciousness. The Latah- startle reflex can be thought of as an override system, that is automatically activated when a sudden unexpected environmental event requires immediate first-priority attention. The essence of startle is that it is the mechanism ensuring that the startled organism responds to a potential danger as rapidly as possible, even before the eliciting stimulus is consciously classified and evaluated: first respond, then assess. (Simons, 1996).
4. From the XXII National Congress of the Italian Society of Individual Psychology: *The Net of Fictions in Adler Theory and Praxis*. 23-25 April 2010, Sanremo (IM), Italy.

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