

Non-Ordinary Mental Expressions (NOMEs): clues on the nature of the human mind

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Abstract

The aim of this essay is to describe several ostensibly odd experiences considered implausible, illusory or hallucinatory phenomena, largely considered to be disorders of the neurological or psychological functioning from the ruling mechanist-reductionist perspective of neurosciences.

A rigorous but open-minded neurophenomenological approach is required to properly investigate and understand such Non-Ordinary Mental Expressions (NOMEs). Individuals who experience NOMEs should not feel like they are outsiders or abnormal and should feel free to talk about their uncommon experiences, and professionals should listen to them with an open-minded, non-prejudicial and non-judgmental approach.

NOMEs challenges the ruling stance of medical and psychological science and suggest intriguing properties of human consciousness, which are likely to be incompatible with the accepted axioms and theories, showing the inescapable epistemological implications of their proper investigation and understanding.

Keywords: altered states of consciousness; anomalous experiences; consciousness; epistemology; non-ordinary mental expressions.

NOMEs: definition and framework

Cardeña, Lynn and Krippner (2004, 2014) introduced the concept of *Anomalous Experiences* (AEs), to overcome the concept of altered states of consciousness (ASCs) (see Vaitl et al., 2005) by listing non-pathological, albeit uncommon, inconstant experiences, (such as synaesthesia) which are divergent from the accepted axioms, theories and deemed plausible facts. Consequently, the essential feature of AEs is their non-pathological nature, although they may partially overlap with psychological and psychiatric disorders. Meditation and hypnosis have not been included in AEs because they may or may not give rise to unusual experiences.

Later on, the term *Non-Ordinary Mental Expressions* (NOMEs) was introduced, to include a broader set of experiences, i.e., both non-pathological ASCs and AEs (Cardeña & Facco, 2015; Facco, 2014; Facco, Agrillo, & Greyson, 2015). The term non-ordinary avoids any prejudice or implicit idea of abnormality or ostensible oddity; instead, it emphasises the diversity of these experiences with respect to what is conventionally admitted. In other words, the concept of NOMEs emphasises the epistemological and metaphysical implications¹ raised by their phenomenology, description and study; this is also a problem at the basis of the study of consciousness and Self as well (Facco & Fracas, 2018; Facco, Lucangeli, & Tressoldi, 2017; Facco, Al . Khafaji, & Tressoldi, 2019). Hypnosis and meditation have been reintroduced into the list of NOMEs, because they have been skipped or misunderstood in the Western cultural climate of the 20th century, the heir of positivism and physicalism. There is also a clear *trait d'union* between hypnosis, meditation, mystical experiences, Near Death Experiences (NDEs), deathbed visions (*End of Life Experiences*, ELE) and memories of previous lives (Facco, 2010, 2012, 2014, 2017, 2018; Facco et al., 2015, 2019c). This

illuminates the need to jointly categorise different and apparently incompatible experiences in order to properly understand their formal analogies, possible common elements and meanings, and the related mind-brain processes. For example, mystical experiences can be cataphatic or apophatic (Forman, 1998). The former has explicit religious contents, including sensory-like experiences (such as visions and auditions) which may belong to specific denominations, while the latter is characterised by the absence of sensory-like experiences, and, as such, is independent of any specific religion. Apophatic experiences share similar transcultural elements – such as the *tabula rasa* of Meister Eckhart in the Christian mystical tradition, the state of *turīya* in the Vedic tradition and the no-mind doctrine in Zen, including the meditation techniques facilitating access to them (Facco, 2014; Facco, 2017; Facco, Lucangeli, & Tressoldi, 2019). The transcendent tonality of NDEs also means they are similar to cataphatic mystical experiences. On the other hand, both have largely been conceived of as hallucinations and/or the result of an individual's brain having gone awry from the ruling positivist, mechanist-reductionist inclination of medicine.

Finally, both apophatic and cataphatic experiences may be engendered by both meditation and hypnosis, two techniques sharing several unexpected common aspects (Facco, 2014; Facco, 2017); as mentioned previously, there is a *trait d'union* between hypnosis and NDEs, while Out-of-body Experiences (OBEs) can easily be induced in hypnosis (Facco, 2012, 2018; Facco, Casiglia, et al., 2019). In fact, according to Barnier & Nash (2008), hypnosis and meditation have a double role in NOMEs, being both the procedure and its product.

NOMEs also include superior states of consciousness, a topic of great interest for both physiology and psychology, despite being misunderstood and neglected by the ruling

¹ Metaphysics is a complex discipline, including both the search for the first principles and supersensible reality in the religious sphere and, in secular thought, ontology, i.e. the science of being and general principles (e.g. concepts such as substance, causality

and purpose); these constitute the cornerstones of scientific reasoning, such as the definition of universals (without which laws cannot be formulated) and of details, the properties of objects and their nature.

objectivist-materialist approach of neurosciences. It is a topic of crucial importance for the proper comprehension of the nature and properties of the Self and the pursuit of its highest realisation – a problem with a long tradition in both the East and the West, extending from the borders of prehistory to modern philosophy and psychology. Given its transcultural relevance, the study of the Self calls for a metaphilosophical approach encompassing its deep epistemological implications and overcoming the conventional ethnocentric and chronocentric perspectives, as well as the limits of the positivist comparative philosophy introduced by Oursel (Oursel, 1923; Facco, 2014; Facco, Al Khafaji, et al., 2019). The study of the superior states of consciousness includes:

- a) The role of meditation and the concept of enlightenment in Eastern philosophies;
- b) The meaning of wisdom, a virtue of the sage pre-Socratic philosophers, which has been irretrievably lost from Aristotle onwards (Colli, 2009);
- c) The role of Greek mysteries in higher knowledge and the experience of *epoptéia*, a concept extensively described by Aristotle (Eudemus, fr. 10);
- d) The shamanic world and its rituality;
- e) The William James' concept of the spiritual Self, as well as his personal experience with nitrous oxide (James, 1882, 1958);
- f) The expansion or enlargement of the Self according to Arieti (1967) and Russell (1912), as well as the superconscious of Assagioli (1988).

Here too, as for other NOMEs, the access to the higher state can be spontaneous, intentional (e.g., following a long practice of meditation) or elicited by psychotropic agents; as a result, it may be transient or persistent, to the point of becoming a new stable condition when pursued with a long and appropriate philosophical-experiential training (e.g., meditation).

The scientific study of NOMEs – as well as all subjective phenomena – calls for a neurophenomenological approach taking into account the first person perspective (1PP) encompassing its value and meaning and merging both first and third person

perspectives (3PP) in a whole (Varela, 1996; Rudrauf et al., 2003).

The aim of this article is to outline several intriguing NOMEs and conditions that may favor or elicit them.

Epistemological and metaphysical aspects

Different NOMEs, such as visions, prophecies, NDEs and mystical experiences, are suggestive of a different and wider reality than the one conventionally admitted by the current *Weltanschauung* (worldview), ruled by classical thought and materialist monism. Indeed, the debate between dualists and monists is at the core of the foundation of the science of consciousness (Facco, Lucangeli & Tressoldi, 2017; Facco & Fracas, 2018). Here, it is worth emphasising that the ruling monist materialist view is metaphysical in nature and, as such, is based on undemonstrated axioms. As a result, none of the available hypotheses about life, death and reality – i.e., the materialist idea of a single, biological life doomed to become nothing, the idea of an afterlife (no matter which otherworldly dimension), and reincarnation – is more plausible, rational and/or truthful than the others (Testoni, Facco & Perelda, 2017). Despite being beyond the field of interest of positive sciences, they are no less relevant and concrete in their assessment of the meaning of life and its doom.

Likewise, all formal axiomatic theories and disciplines (starting with mathematics) include statements which can neither be proved nor disproved, according to Gödel's theorem of Incompleteness (Hofstadter, 1979; Raatikainen, 2018). Therefore, the Galileo's mathematical-geometric apriorism found the basis of science – claiming that behind mathematical cognition "*lurks divine objective certainty*" (Galilei, 1897, p. 82) – is slightly optimistic although effective, while Newton's concepts of universal time and space were introduced relying on common sense and its naïve realism, being "*well-known to all*" by experience (Newton, 1726, pp. 104-105).

Fortunately, the concept of absolute space and time, together with the naïve realism that has largely permeated science, disintegrated in

20th century physics. The location principle has survived in Einstein's physics, but has been undermined by quantum physics, observing phenomena such as *entanglement* and admitting the possibility of quantum teleportation (Fracas, 2017; Musser, 2019). It must also be borne in mind that the physical universe is the greatest and most concrete mystery before our eyes:

- a) About 95% of the known universe is made up of matter and dark energy of which we know nothing;
- b) the observed universe is delimited by the cosmological horizon and we know nothing about the possible physical reality beyond it;
- c) the universe model posed by Poincaré's conjecture foresees that it is topologically a triple-sphere endowed with four dimensions, while the string theory in quantum physics (albeit as of yet undemonstrated) hypothesizes up to 26 possible spatial dimensions (Facco & Fracas, 2018).

It is therefore necessary to maintain a profound humility and the Socratic awareness of knowing that we do not know. This is essential to maintain a correct open-mindedness and refrain from rejecting a priori anything looking ostensibly odd on the basis of the adopted axioms and theories, a temptation woefully witnessed by the universal presence of detractors in the history of science.

Materialist monism is a partial, self-contradictory metaphysical stance and, as such, it is unfit to properly understand the whole world (Facco & Fracas, 2018; Facco, Lucangeli & Tressoldi, 2017). Its limits should be overcome by merging materialist monist and dualist stances in a higher-order integration – which may be named dual aspect-monism, whole monism or holomonism (Facco, Lucangeli & Tressoldi, 2017; Facco & Fracas, 2018; Panksepp, 2005)– encompassing what cannot be understood by each of them individually. In fact, materialist monism, cannot properly understand subjective phenomena and their meaning. Furthermore, it rejects a priori what looks to be “immaterial” without demonstrating its inexistence, thus inadvertently maintaining a latent dualistic, self-contradictory stance. On the other hand, dualists hypothesise transcendent realities,

appearing to be a type of nowhere lands, void of any physical dimension. Instead, if the universe includes spatial dimensions other than the three perceivable by humans, it seems more reasonable and easier to argue that we are simply blind to them. The likely existence of spatial dimensions beyond the three perceived by our sense organs means the hypothesis that what is considered ‘transcendent’ from the classical dualistic perspective is plausible – only due to its inaccessibility to human perception – and can be reduced to an anthropocentric naivety.

If the theory of relativity has complicated the concept of the present, quantum teleportation promises the instantaneous transmission of information over long distances, resulting in being faster than the speed of light;. If so, it would lead to the paradoxical result of reversing the usual cause-effect relationship and being aware of events belonging to the future in another reference system. As a mental experiment, one can imagine a team of astronauts in a mission to Pluto, one of them sending messages to the earth by conventional telecommunication and the other by teleportation. The former, travelling at the speed of light, would take 5.3 hours to reach the receiver on the Earth, while the latter would be instantaneously. As a result, the latter would behave like a type of cyber-prophet providing information about the next future, i.e., being able to predict messages sent by other astronauts and communicating what is happening on Pluto 5.3 hours before other people are aware. As the history of scientific revolutions teaches us (Kuhn, 1962) – it would not therefore be surprising if some phenomena viewed today as implausible and belonging to the uncertain world of parapsychology or science fiction would turn out to be real. As Schopenhauer wisely stated, "*truth is born as a paradox and dies as the obvious*".

NOMEs are a universal phenomenon of the human mind, present in all cultures since prehistoric times: they are the result of its still elusive physiology and its relationship with an unknown world in the superhuman effort to probe the great, unsolved mystery of the meaning of life and death, in the geometry of an equally mysterious space-time. It is the unresolved but fundamental philosophical-

religious-scientific problem of humanity. Thus, a proper understanding of NOMEs calls for an interdisciplinary approach, including neuroscience, philosophy, anthropology and physics: being real facts (though “immaterial” mental ones), they are undeniable, while their interpretation has deep epistemological and metaphysical implications, which cannot be properly addressed or resolved within the limits of a narrow materialist-monist and mechanist-reductionist approach. Their phenomenology is therefore a challenge to the ruling paradigm of medical science. In other words, NOMEs reintroduce the dilemma of the mind-brain-body-reality relationship as well as the huge metaphysical problem of knowledge, in the definition and dialectic between *truth-reality* and *falsehood-illusion*, *certainty* and *faith-belief*, a problem underlining the limits of human capacity and adopted paradigms to grasp the truth, if this is even possible (Facco & Fracas, 2018, chap. 3-4; Testoni, Facco, & Perelda, 2017).

Non-Ordinary experiences

The major non-ordinary experiences, all of which share some common element, will be shortly outlined here and their possible interpretations will be discussed.

Hearing voices

"The preeminent voice, among others, would belong to Herminius, a groom who claims to be indebted to me in a previous life and who, in gratitude, acts as my spirit guide."

"These entities, often dead (even animals) 'transmit' messages to me in the form of images (luminous figures) and thoughts. They don't appear in particular moments but unpredictably, especially when I feel more receptive. The otherworldly spirit belongs to a non-negative world, where there is no judgment, and it manifests itself so that I can be a go-between with a person, sometimes even a stranger."

These are two simple examples of a wide range of experiences, the common feature of which

is the perception of voices directly speaking to the subject and perceived as belonging to other identities. Needless to say, such experiences are often traumatic when they occur in healthy people, since they may be easily taken for symptoms of psychiatric disorders, such as schizophrenia and dissociative personality disorders (DIDs). In fact, for the most of the 20th century, auditory hallucinations were considered as a pathognomonic symptom of schizophrenia.

Mercifully, these experiences have been increasingly studied in non-clinical populations since the 1980s, in order to better understand their features and prevalence, as well as improve their management and prevent the risk of developing severe discomfort or psychiatric disorders, (Salvini and Stecca, 2013; Holt & Tickle, 2014; Iudici, Quarato, & Neri, 2019). ‘Voice listeners’ themselves have greatly contributed to the better knowledge of these ostensibly odd phenomena often in collaboration with mental health professionals - especially the Dutch psychiatrist Marius Romme. In doing so, they have encouraged mutual-help and direct information meetings, which have fuelled the international Hearing Voices Movement and the Hearing Voices Network (www.hearing-voices.org).

At this time, it seems more reasonable to define hearing voices as an extension of the normal inner speech, misattributed to other identities and to take into account that inner speech is an essential activity for cognition and metacognition, planning and making decisions, as well as evaluating, knowing and motivating oneself (Facco et al 2019c).

Seeing presences

"I had the cat in front of me looking at me, and suddenly we both turned to the door of the room. There was a man with dark hair and black eyes looking at me. The thing that struck me the most this time, compared to the other experiences I had, is that it was in the flesh: the other times it was in an ethereal, let's say impalpable form. The cat started chasing him, and the man turned around and left. The doors and windows were closed, it was evening after dinner in autumn/winter. He hit me because he was real flesh and blood, so much so that I

thought he was a thief. He had a stern look, but not aggressive.”

"I was asleep; I wake up suddenly and sit on the bed (I never do), I turn to the right and see this little being with round eyes looking at me and smiling, a very small body compared to the head and the round head, the very small nose, they looked like two dots. As soon as I saw him and we looked into each other's eyes, I felt I was going back to sleep and I fell asleep. After this meeting I spent a week with a peace of mind I've never felt before." Interviews collected by Dr. Giada Righetti

While experiences of this kind are not uncommon in people who are experiencing the recent bereavement of a loved one (Cooper, Roe and Mitchell, 2017), it is interesting to see that they can also be experienced by other people who are not in psychological or physical conditions able to foster illusions of this kind (Badcock, Dehon, & Larøi, 2017). However, the second case happened during sleep and may belong to hypnopompic hallucinations.

Communication with non-incarnated entities

The desire and practices to communicate with people who have concluded their life experience on our earthly dimension goes back to the origins of humanity and likely developed in parallel with religious, spiritual and cultural beliefs thus suggesting a continuity of existence after the death of the physical body. In ancient Egypt, a clear concept of death as a transition to another dimension had already been well described in the *Pyramid Texts* (dating back to 27th-22th century B.C.), the *Sarcophagus Text* and the *Egyptian Book of the Dead*. Likewise, since the beginning of Indian culture the *ātman* (individual soul) was considered as a part of the universal *Ātman*. The *Bardo Thödol (Tibetan Book of the Dead)*, dating back to the 8th century A.C.) describes both a coarse consciousness, closely connected to the brain and dying with it – a concept akin to the Western scientific conception of consciousness as an emergent property of the brain – and an extremely subtle mind-energy.

The latter survives and may move toward the *clear light* reaching its ultimate existence or miss the liberation and be doomed to reincarnation. In ancient China the origin of the ten-thousand beings is the Tao, endowed with its *Yin-Yang* polarity, a concept surprisingly akin to the Parmenides' Being and his concept of Light-Dark (Peri Phýseos, Fr. 8, 52-9). Hippocrates himself holds a view not surprisingly common to Taoism and Buddhism as well as Parmenides' and Heraclitus philosophy of nature. In fact, Parmenides states that everything unceasingly changes and all things are interrelated. Additionally no one is endowed with an autonomous, independent, intrinsic existence: rather, they are simultaneously concordant and contrary in their transformation (*De Diaeta*, I, 3-5). He also warns against the view that everything comes out of Hades and returns to Hades – an opinion of people trusting in their eyes, rather than their reason – because “*nothing which is living can die, and it is impossible that what is not may start to be*” (*De Diaeta*, I, 4, 9).

The ruling modern materialist stance of the West is inclined to consider the whole of these ancient views as naïve beliefs; nevertheless, being axiomatic in nature, it is neither more rational nor better founded. The only basic real fact is the concrete, unsolved mystery of life and death, including our doom, whatever it may be.

In her review of the different forms of communication after death, Julie Beishel (2019) classifies the different forms of communication with other entities as spontaneous, facilitated, assisted and requested. Spontaneous ones are those occurring without a clear intention, but only following a simple desire for this to happen. Instead, facilitated and requested communications are experiences sought through specific techniques, such as the use of psychotropic agents or the use of equipment or other tools, supposed to facilitate the communication with disembodied entities. The most widely known devices are probably voice recorders – a topic also known as psychophony, metaphony or instrumental transcommunication. Regardless, there is no evidence of the effectiveness of these techniques to date.

The study of assisted communication through mediums – or, at least, people believing to have this ability – has obtained interesting evidence in recent years. In particular Julia Beischel and Mark Boccuzzi attempted to verify the alleged information provided by mediums in a controlled manner – i.e., devising experimental designs with the maximum of blindness, in order to prevent the mediums from obtaining their information either or indirectly from the applicants or by conventional sources, such as the internet (Beischel & Zingrone, 2015; Julie Beischel, Boccuzzi, Biuso, & Rock, 2015; Julie Beischel, Mosher, & Boccuzzi, 2017). Currently, the analysis of published studies until 2019 suggests that some of the investigated mediums may have unconventional access to information about the deceased (Sarraf, Woodley & Tressoldi, submitted to publication). Nevertheless, the origin of this information retrieval remains unclear at best – it may depend on alleged telepathy, retrieval from a hypothetical source of universal memory storing all individual experiences, or non-local properties of consciousness-information.

Channelling

Another modality of communication with non-incarnate entities is through so-called channellers, i.e. people who make their voice and body available for communication from alleged entities, which may include both deceased persons or beings who have never had an earthly experience.

Leaving aside the history of these phenomena, which also goes back to the dawn of religions and other cultures, recent scientific research has started to investigate the origin of this information, examining whether it springs from the channeller (such as implicit memory and unconscious sources of information), rather than a hypothetical external intelligent source. On the other hand, this is hardly possible, and is usually a matter of a subjective channeller's report devoid of any possible objective confirmation. For example, should the channeller report messages from an alleged angel or an entity belonging to another planet

or realm, one cannot obviously check whether it is a “real” entity or, rather (and more reasonably), might result from his/her inner world and its projection into the outer world. Therefore, any report of channelling should be interpreted by taking into account its meaning and value without attributing it to any alleged external identity.

A further step to check the source of channellers' information has been attempted by the Hypno-Channelings research programme (Pederzoli et al., 2018). By hypnotically inducing an OBE in the channeller followed by a contact with a discarnate entity, with this procedure it is possible to interview this purported channeled entity through the channeller's voice. Of course, the content of these interviews can still derive from the channeller's or hypnotist's mind. However, if it is possible to obtain information completely unknown to both the channeller and the hypnotist, the probability that they can derive from a “third” source, that is an external entity, is enhanced.

A short excerpt from the interviews with the entity named "Him" (the text can be read in full in "Contents of the interviews with "Him", available at

<https://doi.org/10.6084/m9.figshare.6984251.v15>) is reported below:

"L.P. asks how long, after the extinction of the Physical Body and the Subtle Body, our identity that can be contacted by mediums persists. He also asks how long he can be contacted while he is processing the next incarnation. "He" specifies that these are two different situations. In the former, the Subtle Body is sometimes not well 'synchronized', especially with the passage represented by death, and both a better synchrony and a period of re-elaboration of the experience acquired in life just ended would be desirable, before the possible subsequent incarnation,. Rather frequently the Subtle Body remains, however, after the death of the Physical Body. According to "Him" it is an anomaly, because it shouldn't happen, but that is a temporal phase of quite easy contact: you contact the Subtle Body. When there is a strong emotionality on the part of loved ones, the Subtle Body is influenced by it and finds it difficult to disappear".

"Speaking of waves, a question is asked about the physical support of electromagnetic waves, as water is for sea waves or air for acoustic waves. "He" tells that space is not empty: it can be said that it is full of something that can be called 'ether' a matter-non-matter always in motion, in which waves are not really waves, but things that are created, disappear and recreate themselves to disappear again. Something to do with the continuous creation of virtual particles and antiparticles (particle failures) that immediately erase each other, a feature of the so-called 'quantum vacuum'. The wave is a summation of a very high number of microphenomena of appearance/disappearance".

Clearly, these above reports are nothing more than the channellers' opinion, far from showing the possibility of communication with entities in other hypothetical realms; Nonetheless, the Hypno-Channeling procedure can be used to explore these ostensibly odd mental facts and verify some of their physiological correlates as done for example by Wahbeh, Carpenter, & Radin, (2018); Wahbeh & Radin, (2018) and Wahbeh, Cannard, Okonsky, & Delorme (2019).

Transpersonal Experiences

Unlike contact with disembodied entities, transpersonal experiences – also called mystical or spiritual experiences – refer to a direct contact or union with a primary spiritual principle, named in different ways according to the ethnic and socio-cultural background (e.g., God, Brahman, Allah or any other entity). Here is an excerpt of a recent case studied by Facco, Lucangeli, & Tressoldi, (2019a):

"We are essences/essences of love Almost reunited with the whole thing.

... I feel myself a current that has flowed and passed through.

We are all reflected in the same light... Acknowledgement of being a spirit... And

I see my outline of semi-opaque light superimposed on the outline of full light in which we are immersed...

I see silhouette Me in the Whole's silhouette And I mean Spiritual Peace...

... And I mean what is to be understood of us individual cells of the same spirit...

In each one is imprinted the DNA of the Spirit... but each one lives to accomplish more than herself...

And I mean... ...each one of them completing themselves and the life of the entire organism...

...and as I pray I see my unfinished body thinning as the Essence of God's Imagination Similarity expands... ”.

These experiences, with their fusional flavour, allow one to overcome the usual dualistic separation between the self and the outer world and realize to be an inseparable part of it. They are closely related to the above-mentioned enlargement of Self, an example of which is the outstanding NOME that Federico Faggin – the inventor of computer processors and a leading authority in the field of artificial intelligence – has described in his autobiography (Faggin, 2019):

"When I went back to bed, as I waited in silence to fall asleep again, I felt a powerful charge of love energy emanating from my chest, that I had never felt before.

This feeling was clearly love, but a love so intense and so incredibly fulfilling that it outweighed any idea or experience of mine about the nature of love. I perceived it as a wide beam of white, glittering, vivid, blissful light bursting from my heart with incredible strength. Even more incredible was to experience that the source of that love was me! Suddenly that light exploded and filled the entire room and then expanded to embrace the entire universe with the same white splendor. Then I knew without a shadow of a doubt that this was the 'substance' of which everything that exists is made. It was what created the universe from itself. To my great surprise, I recognized that light was me! The whole experience lasted perhaps less than a minute and changed me forever."

These experiences are mainly spontaneous, as in the above-mentioned cases, but they may also be elicited by specific procedures, such as meditation practices of the kind described by Chen, Qi, Hood, & Watson, (2011) or by the controlled intake of psychotropic agents, such as psilocybin (Griffiths, Richards, Johnson, McCann, & Jesse, 2008) or ayahuasca (Bresnick & Levin, 2006; Trichter, Klimo, & Krippner, 2009).

As far as psychotropic agents are concerned, it is worth underscoring the risks implied in their use. In fact, their capacity to yield NOMEs is closely related to a strict ritual control, as performed since the antiquity by native religions and shamanic practices, such as the Brazilian Santo Daime and the Bwiti religion in Gabon. The latter uses iboga in the rites of passage to induce NDE-like experiences (Alper, Lotsof & Kaplan, 2008; Maas & Strubelt, 2006; Strubelt & Maas, 2008). The same is true for ancient Greece, in which psychotropic drugs (likely opium seeds and, perhaps, other unknown agents) were used in the initiation rites of the Eleusis Mysteries to reach the *epoptéia* (as described by Aristotle in *Eudemo*, Fr. 10). Any artificial shortcut to induce spiritual experiences may be very harmful both from a psychological and physical point of view, including severe physical adverse events (e.g., cardiac arrest with iboga) and post-traumatic stress disorders, even following the intake of single doses of hallucinogens like ketamine (dos Santos, Bouso, & Hallak, 2017).

OBEs

According to some surveys in English-speaking countries, spontaneous OBEs in physiological conditions are reported by an average of about 9 % of respondents and up to 26% of people, who claim to have experienced at least one OBE in their lifetime (Alvarado, 2015; Braithwaite et al., 2011). Only rarely are these experiences voluntary complicating any scientific investigation into their physiological and phenomenological features (Carruthers, 2015; Smith & Messier, 2014).

This limitation may be at least partially addressed with hypnotically induced OBEs

(H-OBEs) (Facco et al., 2019b; Pederzoli & Tressoldi, 2018). The advantage of H-OBE is the possibility to study them with EEG and neuroimaging techniques as well as to interview the participants and administer them psychological tests during their H-OBE, in order to check their features and compare them to the ordinary state of consciousness.

H-OBEs have been recently compared to OBEs imagined in a state of ordinary consciousness (I-OBE) (Facco et al., 2019b). The results showed significantly higher scores of the altered state, positive affect, altered experience, and attention subdimensions of the Pekala Consciousness Inventory in H-OBE than in I-OBE; unlike I-OBE, this was associated with a significant power decrease in beta and gamma EEG activity in the right parieto-temporal derivations. The EEG findings were in line with the role of the right parieto-temporal junction in multisensory integration and feeling of self-location (Ionta et al., 2011).

This technique also allowed researchers to detect OBE-related changes in the experience of vision, time and movement (De Foe, Al Khafaji, Pederzoli, Prati, & Tressoldi, 2017; Tressoldi et al., 2014, 2015):

- a) *"I see it [an object] a little bit all at the same time, then, as I think about going through it, I see the inside too. The body sees in three dimensions, while in this state I perceive by intuition all its essence, including all the information about the object. "*
- b) *"I do not perceive any sense of movement from one place to another, but a sort of immediate displacement with the Psychic Body",*
- c) *"It is as if time has stopped. I feel really good. I can move right, left, above and below in a non-concrete space that seems to be infinite. I can also go to another space, darker and more concrete, and move there as I like."*

Near-Death Experiences

Today, NDEs are the best known and most intriguing NOMEs, in the context of which OBEs were first described. End-of-life visions

have accompanied the whole history of the human kind since the prehistory, but in the 20th century, ruled by the monist materialist stance of scientific medicine, they have been neglected or even disparaged. Despite being real clinical facts with a clear phenomenology and epidemiology, they have at best been a priori rejected and reduced to a matter of brain dysfunction and psychiatry at best. The reason for their refusal closely depends on the ostensible incompatibility between their transcendent flavour and the ruling materialist approach of medical science, a problem dating back to the friction between the nascent science and the Church in the 17th century. In fact, being placed at the boundary between life, death and thereafter, NDEs clashed with the doctrine of the *Two Magisteria*, held by Pope Pius XII and later on endorsed by the American Academy of Sciences of USA as well (Alberts, 1998; Facco, Agrillo & Greyson, 2015).

Fortunately, following the seminal works of Moody Jr. (1977, 1980) an increasing interest has developed at the end of the last century and a wealth of data are now available in the literature. Furthermore, their incidence has likely increased, paralleling the development of intensive care and resuscitation and the related reduction of mortality in critical care.

NDEs occur during life-threatening conditions (e.g., cardiac arrest and haemorrhagic shock) alongside a loss of consciousness, but have also been reported in non-critical conditions, such as during haemodialysis or during severe psychological distress (Charland-Verville et al., 2014; Facco & Agrillo, 2012a, 2012b; Gabbard, Twelmlow & Jones, 1981; Lai et al. 2007).

Their main features are now well known and can be summarised as follows:

- a) Awareness of being dead;
- b) OBE;
- c) Passage through a tunnel ending in a non-ordinary dimension in which visual and auditory perceptions seem to be enhanced;
- d) Experience of great peace and well-being, immersed in a celestial landscape or a light that emanates a feeling of great bliss and love;

- e) Meeting with deceased relatives and/or non-defined entities, often reported as beings of light;
- f) Holographic life review;
- g) Perception of a limit not to be trespassed, often with someone (entity or deceased relative) warning him/her to go back because his/her mission has not yet ended;
- h) Return to the physical body with a clear awareness that it was not a dream or a hallucination, but a real experience; the return is usually unpleasant, given the gap between the profound bliss during the NDE and the post-critical clinical condition.
- i) An indelible memory and lifelong positive permanent effects on the meaning of life and death, leading to self-transformation and the fear of death being overcome.

Several hypotheses have been advanced in recent years in an attempt to provide a neurobiological interpretation of NDE features, all of them based on the ruling mechanist-reductionist stance, which considers them to be a plain by-product of brain going awry. However, none of these hypotheses has been demonstrated so far, while some of them are ill-founded, being contradicted by already known facts. As a whole, they reflect the huge challenge of framing them within the ruling paradigm of main stream medicine; on the other hand, NDEs are endowed with huge epistemological implications, an essential aspect for their proper interpretation. The main available hypotheses will be only listed here, for the sake of concision (for further analysis see Facco, 2010, 2018; Facco & Agrillo, 2012b; Facco, Agrillo & Greyson, 2015):

1. Retinal ischemia as a cause of tunnel vision;
2. Acidosis and ionic shift;
3. Increased release of endogenous opioids, glutamate and/or other neurotransmitters as well as administered drugs as a cause of changed emotional state and hallucinations, equating NDEs to delirium;
4. REM intrusions, equating NDEs to hypnagogic or hypnopompic hallucinations;
5. Temporal lobe epilepsy;
6. Residual EEG activity during cardiac arrest.

7. Dysfunction of the parieto-temporal junction as a cause of OBEs;
8. Psychological interpretation (i.e., expectation of hereafter).

Very uncommon well-documented cases were able to witness what happened in the emergency room during their cardiac arrest from outside their body; in the last of these cases, it was also possible to estimate the persistence of consciousness for at least three minutes during ventricular fibrillation (Sabom, 1998; van Lommel et al., 2001; Parnia et al., 2014). These data challenge the present knowledge about the physiology of consciousness and brain and call for further study in order to achieve a better interpretation encompassing them. It remains a scientific problem to be rigorously investigated, which allows researchers to reasonably discover the unknown properties of consciousness.

Besides studying NDEs in real time as soon as the patients regain consciousness, a possible way to study NDEs is by reliving them during hypnosis, as in the case of OBEs.

Palmieri et al. (2014) have used hypnosis and EEG monitoring to improve recall and decrease memory inaccuracy in patients with previous NDEs, as well as check their neural markers compared to memories of both real and imagined events. NDE memories were similar to real memories as regards detail richness, self-referential, and emotional information and differed from memories of imagined events. Their EEG correlates were significantly differed from memories of imagined events, being associated with theta band activity (a well-known marker of episodic memory) and delta band activity (related to mental activities like the recollection of the past, as well as trance states, hallucinations, and other related portals to transpersonal experiences). In short, NDE memories are stored as episodic memories of events experienced in a peculiar state of consciousness.

Hypnosis and the Greyson's NDE scale have also been used to investigate 36 cases reporting

spontaneous memories of past life episodes, déjà vu and/or recurring dreams relative to events and people unrelated to participants' current life. The hypnotic regression to previous lives and deaths showed similar features of real NDEs, despite achieving a lower NDE scale score (Pederzoli, De Stefano, & Tressoldi, 2019). This study shifts the topic from NDEs to the memories of past lives, which will be subsequently be outlined.

Previous life memories

Likewise NDEs, the problem with memories of previous lives, seems ostensibly odd, appearing to be closely related to philosophies and religions extending far beyond the perspective of positive sciences and even beyond the sphere of the monotheist Abrahamic tradition. Nevertheless, the foundation of all of them is metaphysical in nature, relying on undemonstrated principles, hypotheses and theories². If this is the case, one should adopt a metaphilosophical and metareligious approach able to overcome possible prejudices, as discussed in detail by Facco, al Kafaji & Tressoldi, (2019).

The memory of past lives suggests the idea of reincarnation, but they prove nothing; on the other hand, reincarnation is neither less rational nor plausible than the idea of a single life (with or without hereafter). In Western culture belief in the reincarnation was held by Plato (see the myth of Er) and by Origen (3rd century A.C.) in Christendom; but was then withdrawn by the Church following the Synod of Constantinople in 543 A.C. Thus, its disappearance from Western culture reflects nothing more than a cultural filter engendered by the doctrine of the Church, while the East, especially India, has always held it.

The problem of reincarnation calls for a rigorous rational approach and a genuine philosophical perplexity, while the memories of previous lives are real clinical facts in themselves, neither demonstrating nor disproving any philosophical assumption. As a

² In this regard, it is worth noting that the term theory stems from the Greek θεωρία (theoría), in turn stemming from θεωρός (sacred ambassadors, sent by city-states to consult oracles, give offerings at shrines

or attend festivals); this includes the root θεός (*theós*, god).

result, the duty of scientific research is to analyse them without prejudices of whatsoever origin (including scientific ones), in order to facilitate their proper comprehension.

The problem of previous lives is twofold: a) spontaneous memories, especially in small children; b) hypnotic regression to previous lives.

Using the term “reincarnation” in PUBMED, 130 articles can currently be retrieved. Following the pioneering work of Ian Stevenson (1960, 1977), over 2500 children (mainly preschoolers) reporting memories of other deceased identities have been described to date, including Western children – i.e., people belonging to a culture which does not admit reincarnation. The available data show the following facts (see Mills & Tucker, 2014) and Tucker, 2008 as reviews):

- a) Spontaneous memories arise at an average age of three years and are forgotten during school age, like many childhood memories.
- b) The data recorded in several cases allowed Stevenson to verify the truthfulness of memories and trace the identity of the deceased person, in the majority of cases resulting in a violent death.
- c) Some children have intriguing marks and /or birth defects corresponding to the site of the injury causing the death of the perceived identity (e.g., the entry wound of a bullet).
- d) A 16 months median elapsed time between the death of the recalled identity and the child’s birth has been estimated.
- e) The memories mainly deal with the last part of the previous life and are associated with strong feelings.
- f) Some children’s behaviors seem to be coherent with the reported previous life, including affection for family members in the previous life and symptoms similar to those of post-traumatic stress disorder (e.g., fear of water when the previous identity died by drowning).
- g) The psychological profile of these children shows greater verbal skills, better memory and school performance and more social activity than their peers and no meaningful psychiatric symptoms (Haealdsson, 1995; Haraldsson, 2003).

Matlok's recent book (Matlok, 2019) and other articles on individual cases (Masayuki, 2017; Tucker, 2016), also support the reality of this kind of experience.

In conclusion, the memories of past lives are clear, undeniable facts, calling for a proper interpretation. These may fall within the current materialist monist *Weltanschauung* or call for a shift of paradigm, allowing researcher to better face their complexity and understand potential unidentified laws of Nature.

Hypnotic regression to alleged previous lives looks to be a much simpler phenomenon generally unrelated to genuine facts and, therefore, may be regarded as a matter of pseudomemories. The capacity to report previous lives is also related to hypnotisability, cultural and religious background and higher scores on measures of magical ideation and absorption (Meyersburg et al. 2009; Pyun & Kim, 2009; Stevenson, 1994). On the other hand, the fact of being pseudomemories does not exclude their meaningful content, in that they may arise as imagined and conceptualised symbolic representation of anoetic emotions and contents springing from the unconscious, in order to make them noetically definable and tellable (Facco et al., 2019c). If so, they could aid psychotherapeutic interventions in exploring patient’s unconscious in a way akin to dream interpretation.

To the best of our knowledge only two cases of veridical memories have been reported in the literature on hypnotic regression to past lives. The former was a patient reporting an intriguing correspondence between his uncommon medical conditions and past life memories, of which no satisfactory interpretation is available. Here also, one might speculate that his memories might represent a symbolic, tellable story of something going wrong unconsciously perceived in an anoetic manner. The second case was an American woman who recalled the identity of a Spanish woman named Michaela Maria Ruiz de Prado who lived during the 16th century. The report was very detailed and included several facts never published in English, some of them retrievable only in Archives in Cuenca (Spain) (Tarazi, 1990; an excerpt can be found at ([13
Electronic copy available at: <https://ssrn.com/abstract=3552592>](https://psi-</p></div><div data-bbox=)

Presentiments and Precognitions

According to the Merriam-Webster dictionary, the definition of presentiment is: "... a more or less obscure, vague, indefinite sensation of what might happen". When dealing with sensations, one must take into account their psychosomatic nature, including both physiological aspects – such as cardiac, respiratory and digestive symptoms, – and emotions. Here, we shall refer only to those not depending on more or less conscious reasoning processes, i.e., from expectations stemming from prior knowledge. For example, when we often travel a road with dangerous intersections, we may have a feeling of someone entering our lane, a feeling which may be favoured by our previous experience. Instead, no previous experience may justify a more or less conscious, vague emotion of discomfort occurring when we walk a familiar, safe path and then realise that the roadside has fallen away a little further ahead. In other words, the core of the problem is if and how one can anticipate rare and unpredictable events.

Despite the anticipation of random future events being considered impossible, some evidence of this phenomenon has been collected in recent years by checking physiological reactions a few seconds before the administration of pleasant or unpleasant random images (e.g., car accidents or gun shoot in the face, Duggan & Tressoldi, 2018; Mossbridge, Tressoldi, & Utts, 2012).

The essential difference between presentiments and precognitions is that in the latter one is aware of it and can thus translate it into thoughts and words, for example:

"I was 15 and it was Sunday. I was in the bathroom, and I was about to get in and out (it was 9am). At one point, a voice behind me told me to come out later. It hit me very hard, I looked back but obviously nobody was there. After 15 minutes, my grandfather's desperate

screams from the ground floor. He was feeling sick while my grandmother was passed out. I stepped in immediately, diagnosed a poisoning from the furnace, and saved their lives. If I had gone out at the usual time, they would have died." Or: "I happened to have to go at all costs to a company where they had suffered several thefts. I wanted to go that Wednesday for no reason, they indulged me and I saw where they were coming in the next time. I worked on the energy level blocking the entrance and that night at 01.20 the burglar alarm rang, but the thieves couldn't get in."

Despite appearing to be uncommon and/or odd, these kinds of phenomena can be scientifically studied. For example, Storm et al. (2017) reviewed 50 studies on the so-called dream-ESP experiments (i.e., dealing with veridical dreams) aiming to scrutinise the ability to perceive information related to a particular image, while dreaming. The results clearly revealed that the identification rate of the correct images was significantly higher than would be expected by chance.

Seeing at a distance

Unlike precognition, seeing at a distance or 'Remote Viewing' (a very popular term on the internet), is defined as the conscious and voluntary ability to collect information about objects, people, places, regardless of distance and time and any possible barrier able to mask them. Granted this possibility, the collection of present, past or future information would also be possible.

Let us report a well described example dealing with an experiment performed on November 3, 2003 about six weeks before the capture of Saddam Hussein with a group of experts in this technique (Schwartz, 2018). The participants were asked to describe the location and circumstances of Saddam Hussein at the time his location would have become known to American forces. The participants' imagined location was the following:

"Saddam will be found "underneath an ordinary looking house. It is on the outskirts of a small village"; "Near Tikrit"; "The house is part of a small complex"; "Delimited on one

side by a dirt road and, at the back, by a nearby river"; "The house can be identified because it has a large tree growing at both ends and has a strange kind of partial second floor above the front door".

Figure 1 shows a photo of the place where Saddam Hussein was captured (released by the U.S. Department of Defense), including many details described during the remote viewing.



Figure 1: Photo of the place where Saddam Hussein was captured, released by the U.S. Department of Defense (from Schwartz, 2018).

An example like this is incapable of establishing the reality of this phenomenon, but is still intriguing.

The Star Gate project (conducted from 1972 to 1995) is one of the most famous projects using remote viewing for US intelligence purposes (all information can be found in Marwaha and May 2017, 2018).

This project was funded with approximately \$20 million, but the American Institutes for Research declared that the psychic-spy operation had been a bust. However, Jessica Utts, president of the American Statistical Association, correctly emphasised that establishing the reality of the phenomenon is a different problem from that of examining whether it may be useful for government purposes (Utts, 1996). As far as the former is concerned, in her analysis she reported that there is no doubt that "*Using the standards applied to any other area of science, it is concluded that psychic functioning has been well established*".

Remote viewing has also been used in archaeology, such as in the recovery of the American brig *Leander*, sunk in 1834 while en

route from the island of Cuba to Boston, Massachusetts (Schwartz & De Mattei, 2000). Schwartz's experiment on the remote viewing of Saddam Hussein's location suggests the odd idea of the possibility of retrieving information from the future. Other studies suggest a significant albeit small increase in correct predictions with respect to chance, (Kolodziejzyk, 2013; Smith, Laham, & Moddel, 2014), while others fail to show any positive result (Katz, Grgć, & Fendley, 2018). Remote viewing has also been used in police investigations, of which the most outstanding fact is the kidnap of American Brig. Gen. James D. Dozier by the Red Brigades in Italy on Dec. 17, 1981. The Washington Post published an article by Sally Squires entitled "The Pentagon's Twilight Zone" on April, 17, 1988, reviewing it and concluding that it was unsuccessful. On the other hand, a released CIA report confirms the use of remote viewing and its success: "*On 18 December, we conducted our first session... This is a drawing of the first session which was sent to Italy... The search for General Dozier should be concentrated in the Padua area... This briefing was done two days prior to General Dozier's actual rescue... Among other information obtained in a session on 21 December was the following... The only city found in northern Italy to contain a unique circle park with a cathedral was Padua... 8 days prior to his release, the remote viewer named the location of Gen. Dozier as Padua*" (<https://www.cia.gov/library/readingroom/docs/CI A-RDP96-00788R001700270020-4.pdf>).

Mind interaction at a distance

Mind to mind interaction at a distance belongs to what is commonly named telepathy, which refers to shared information between people not attainable by conventional means.

At the end of 2018, 128 studies on the Ganzfeld protocol³ were available and freely accessible for independent analysis (Tressoldi, 2018); their aim was to maximise the sensory and visual isolation of participants, in order to

yield pseudo-hallucinatory percepts and so-called altered states of consciousness.

³ In the Ganzfeld protocol subjects are exposed to an unstructured, uniform auditory and visual stimulation field, which elicits a sensory deprivation and may also

check their capacity to identify what their partner saw or heard. As a whole, these studies showed the capacity of isolated subjects to identify their partner's perceptions with on average a 7% higher than chance.

The synchrony between coupled subjects may also involve unconscious processes, such as EEG changes yielded by visual and/or auditory stimulation in the participant (the transmitter) located at a distance in another isolated room (Bilucaglia, Pederzoli, Giroladini, Prati, Tressoldi, 2019; Giroladini et al, Tressoldi et al., 2014, 2016; Giroladini, Pederzoli, Bilucaglia, Prati, & Tressoldi, 2018; Tressoldi et al., 2014).

The hypothesis of mind interaction stems from the possibility of non-local properties of consciousness: perhaps, the world at large is less "local" than believed so far and Nature might reveal itself as a huge integrated, complex system made of interrelated events including all living creatures (Atmanspacher, 2014, 2015; Barlow, 2015; Charlton, 2007; Connolly, 2015; Neppe & Close, 2015; Walach & Romer, 2011; Wang et al. 2013).

The available studies deal with both mind interaction and synchronicity – the latter stemming from Jung and Pauli's long lasting collaboration largely based on speculative reflections. The first experimental studies on mental entanglement were published at the end of the last century (Grinberg-Zylberbaum & Ramos, 1987; Grinberg-Zylberbaum et al., 1994) and reported synchronous EEG changes in couples of subjects separated by faraday chambers 14.5 meters apart when one of them was stimulated by flashes. Later, a similar experiment was replicated in 30 pairs. One of them was instructed "to attempt to send an image/thought" and the other "to remain open to receive any image/thought from his/her partner." Five out of the 60 participants showed event-related EEG signals during image/thought transmission, suggesting that in some pairs of subjects a signal may be somewhat detected by the distant partner (Standish et al., 2004).

Richards et al. (2005) examined the effects on receiver's brain by both EEG and fMRI while the transmitter was submitted to flash

stimulation; the results showed significant event-related changes, especially in visual brain areas (Brodmann areas 18 and 19).

In conclusion, the idea of mind to mind interaction at a distance – despite being ostensibly odd when observed by the traditional positivist-materialist approach anchored to classical physics – seems to be more plausible and real than commonly believed and is worth of further investigation to explore and better understand it. In the literature, the terms transmitter and receiver are usually adopted, according to the terminology of telecommunication. Rather, it seems us more appropriate to consider them as forms of 'shared' information since the mechanisms of the observed coupling are unknown: they might be the expression of correlation between the two, thus merging them into a unit. This might make the sharing akin to a sort of mental entanglement, although not necessarily implying a one or two-way transmission between separated terminals.

Non-ordinary Interactions of Consciousness

Interactions on human behaviour

An example of possible non-ordinary interactions on human behaviour is the so-called 'Maharishi effect' – named after Maharishi Mahesh⁴ the Indian yogi founder of transcendental meditation in the West and of the Maharishi University⁵, which offers degree courses from physics to computer science, all inspired by the teachings of this spiritual master.

The Maharishi effect stems from the claim to potentially indirectly modify a population's behaviour and/or negative events through transcendental meditation exercised by a number of meditators equal to approximately the square root of 1% of this population (e.g., 100 meditators would be enough for a population of 1,000,000 people). This formula was based on the Hagelin's quantum field theoretical model, (Hagelin, 1987). According

⁴ https://it.wikipedia.org/wiki/Maharishi_Mahesh_Yogi

⁵ <https://www.mum.edu>

to this hypothesis, the simultaneous deep meditative state in many subjects would create a field of psychophysical coherence for the entire population, reducing the number of negative events, such as assaults, rapes, road accidents, etc.

Empirical support for this theory has been found in more than 50 studies (Cavanaugh & Dillbeck, 2017; Dillbeck & Cavanaugh, 2016, 2017; Orme-Johnson, W., & Oates, 2009). Indeed, the strange, ostensibly esoteric idea of mental interaction is much more common than traditionally believed, since it is not different in principle from the routine practice of prayer in all religions; in fact, prayer is routinely recommended by priests and jointly exercised by worshippers. Regardless, we cannot imagine whether the world could get any worse without the incalculable amount of prayer that everyday is recited on a day-to-day basis.

Mental interaction on health

This topic refers to the studies of Remote Healing and Intercessory Prayer, which differ from each other according to the cultural and theoretical models they are referred to. For example, in the mental-energy model held by Reiki, the intention of healing is understood as a direct relationship between practitioners and patients, while in theistic religious models the intention of healing is understood as an indirect relationship through prayer to high spiritual entities, such as God, Jesus Christ or Saints believed to be able to act.

Given the difficulties present in conducting controlled clinical trials also taking into account the placebo effect, there is little evidence to support these remote interactions. On the other hand, the placebo effect is a real therapy and might also be at the base of remote healing as well, where rituality, motivation and faith may be powerful catalysts able to empower patient's capacity for healing. It is worth noting here that in ancient Egypt and Greece (in the temples of Imhotep and Asclepius, respectively), incubation had been practiced for some 3,000 years as the inescapable psychosomatic component of the Hippocrates' holistic, rational approach (Facco

& Tagliagambe, 2020). As a result, incubation, which was used to heal both medical disorders and allow recovery from surgery, can be considered as the ancestor of the modern hypnosis. It was later abandoned in the 5th century A.C. due to the huge efforts of the hagiographic Christian propaganda, aimed to withdraw paganism, but survived in Chirstendom as the idea of miraculous healing (Lourdes is the most famous places where this might occur).

History shows a close link between medicine, religion and healing: the crucial disease-related problems – i.e., chronic intractable pain, disability and death – still belong to the sacred, because they inescapably involve the meaning of life and its doom (Le Breton, 2007). The reappraisal of placebo as a true, valuable agent exploiting patient's resources for recovery also provides evidence of its relevance for therapy, a fact misunderstood by the objectivist-materialist approach.

Only a few meta-analyses on distant healing are available, providing, as expected, contradictory results (Astin, Harkness, & Ernst, 2000; Hodge, 2007; Masters, Spielman, & Goodson, 2006); besides their intrinsic limits and pitfalls, the lack of meaningful results also depends on the great differences of the adopted techniques and healing goals, encompassing many physical as well as psychiatric disorders. In this regard, the study of the effects of healing intentions on animals are even more interesting, being animals presumably being less influenced by expectations and, thus, the placebo effect. For example, William Bengston et al. (2007, 2012, 2018), reported the healing of lab rats that had been injected with lethal cancer cells, by exercising simple mental techniques centred on the intention to heal and a mental connection to the animals to be healed, without any direct contact.

Interactions on organic compounds

Several studies investigating conscious mental interaction at a distance on the growth of organic material, such as plants, seeds and cell cultures, seem to provide better results than those on humans. In the last meta-

analysis, 49 of these experiments were analysed by Roe, Sonnex, & Roxburgh, 2014. For example, a study aiming to inspect whether stored or recorded “energy” may have an impact on breast cancer cells in vitro, using energy-charged cotton, hands-on treatment by healers and electromagnetic recording of healers practicing. Surprisingly the authors discovered a significant downregulation of ATP citrate lyase and interleukin 1b after 4 and 24 hours of exposure to the recording in 3 independent experiments and concluded that: a) a reproducible effect can be obtained; b) healing intention can be captured and released and c) hands-on delivery of healing intention is more effective than recording (Beseme et al., 2018)

Radin, Hayssen, & Walsh, (2007) and Shiah & Radin, (2013) performed a double-blind, randomised, placebo-controlled experiment to assess whether chocolate exposed to good intentions by a group of meditators might enhance mood more than unexposed chocolate. The results showed a significant improvement of mood and a decline in fatigue only in the intention group.

Non-ordinary interactions with electronic equipment

Studies on mental interaction with electronic equipment, mainly on random number generators, date back as far as the 1930s (Duggan, 2019), and a review of more than 300 studies has been published by Bösch, Steinkamp, & Boller (2006).

The latest developments in this line of research aim to: a) better understand the role of the mind on subatomic particles, such as photons (Radin, Michel, & Delorme, 2016; Radin, Michel, Johnston, & Delorme, 2013; Tressoldi, Pederzoli, Matteoli, Prati, & Kruth, 2016) and b) demonstrate the possibility of building up mentally controlled electronic equipment (Tressoldi, Pederzoli, Prati & Semenzato, in press).

Clues about our nature

The aforementioned data reported above deal with intriguing but ostensibly odd phenomena, which have been rejected a priori by many scientists, and heirs of positivism, due to the incompatibility with the adopted axioms and theories. Nevertheless, they are “real” mental non-pathological facts requiring a proper explanation. In the comprehension of NOMEs two options are possible: a) all of them are fancies and should simply be discarded and b) their oddity at least partly depends on the ruling paradigm, a huge epistemological problem. In fact, science, as any other rational discipline, is metaphysically grounded on plausible but undemonstrated axioms and can only perceive and check what is compatible with them. In other words, seeing means simultaneously being blind to what is beyond the field of view, a fact well painted by a famous anecdote dealing with a man under a street lamp looking for the house keys he lost elsewhere, because that was the only place where he was able to see.

Furthermore 20th century physics has undergone a radical revolution and a shift of the extant paradigm in order to understand the ostensibly absurd properties of space-time and matter-energy. Perhaps, science, which is still anchored to the physics of the 19th century, will begin to undergo a similar rethinking of its paradigm in the near future. A clue to this possible change is the recent introduction of quantum biology and quantum theories of consciousness (Facco & Fracas, 2018; Lambert et al., 2013; Mohseni, Omar, & Plenio, 2014; Poznanski, Tuszynski, & Feinberg, 2017). If this is the case, a new rigorous scientific perspective may open up, allowing researchers to better understand some of the previously described phenomena. Likewise, both materialist monism and dualism, which are traditionally at the base of both science and religion, look to be partial, unsatisfactory views requiring a reappraisal (Facco & Fracas, 2018; Facco, Lucangeli & Tressoldi, 2017).

We do not claim anything about the truthfulness of the described phenomena, except for the need to face what looks to be ostensibly odd with a rigorous scientific, open-

minded approach, in order to comprehensively examine it. It also calls for a genuine skeptic stance (according to the original Greek meaning of the term σκέψις-*skèpsis*), i.e., reflection, search, refusal of dogmas of whatsoever origin (even scientific ones), and the nurture of a rigorous doubt neither admitting nor excluding anything a priori. Any other stance is subjected to a dogmatic drift, leading to two possible opposite flaws: a) to implicitly trust non-existent phenomena and b) to neglect a priori existent ones. Both of them are affected by a similar but opposite dissociation from reality.

All NOMEs, if properly understood, may shed much light on the true nature of the human mind and the relationship mind-world, of which the Popper's and Eccles' theory of the three worlds is an appropriate model (Facco & Fracas, 2018; Facco, Lucangeli & Tressoldi, 2017; Popper & Eccles, 1977). Here, the unconscious – to be metaphorically meant as a great, still uncharted ocean, extending to the Jung's collective unconscious and even farther, to the Zen no-mind (Facco, Al Khafaji & Tressoldi, 2019) – plays an essential role.

Nonetheless, NOMEs cannot only be faced by a narrow mechanist-reductionist paradigm only; rather, they call for a neurophenomenological approach taking into account the content and meaning of subjective experience.

Some NOMEs, like the intriguing experiences of other identities and previous lives lay as non-pathological phenomena in a continuum between normal consciousness and dissociative identity disorders. Their

neurobiological base involves the complex interrelationship between the default mode network, the salience network and the central executive network – a highly integrated set of functional, dynamic brain attractors, which interplay with both experience and introspective activity providing the base of inner life and its relationship with the outer world (Facco et al., 2019c). If so, hypnotically elicited previous life experiences may be the result of conscious noetic narration of unconscious anoetic emotions; according to the model introduced by Solms and Panksepp, they are likely the expression of meaningful aspects of the subject's inner life, which cannot be communicated unless symbolically imagined and conceptualised (Panksepp, 2005; Solms & Panksepp, 2012).

Finally, the objectivism of positive science looks to be a transcendental naivety, as Husserl (1970) defined it. In fact, science in itself is a product of the human mind aimed to provide the most rigorous rational knowledge. As such, it inhabits and lives in the world of consciousness, the nature of which is irreducibly subjective, while the so-called objectivity cannot trespass the boundaries of shared subjectivity. This should be sufficient to begin to overcome the century old Cartesian split between mind and world adopted by both dualists and materialist monists, an essential step to better comprehend consciousness and its place in the world.

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