
NEAR-DEATH EXPERIENCES AND HYPNOSIS: TWO DIFFERENT PHENOMENA WITH SOMETHING IN COMMON

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ABSTRACT

Near-death experiences (NDEs) are an intriguing and somewhat awkward topic in the scientific medicine. They can be defined as the memory of impressions occurring during life-threatening conditions, including a number of special elements such as out-of-body experiences, pleasant feelings, seeing a tunnel, a light, deceased relatives, or a life review. Their transcendent tonality leads one to consider them a priori as doubtful or non-existent, not relevant, or a matter of psychiatric or organic disturbances at most. The available interpretations of NDEs, despite being scientifically sound, so far remain only speculations or, at best, clues without any demonstration, while others are not even plausible or neglect facts incompatible with the ruling mechanistic and reductionistic view, showing the deep epistemological implications of their explanation.

In the past few decades NDEs, hypnosis, relaxation, and meditation have been included among the so-called altered states of consciousness (ASC), together with other physiological and pathological conditions, such as dreaming, sensory deprivation, hypnagogic states, epilepsy, effects of hallucinogens, and psychotic symptoms. However, the very term ASC, semantically suggesting abnormality, looks to be questionable for physiological mind activities like hypnosis and meditation.

NDEs and hypnosis appear as two entirely distinct phenomena, but some common processes probably tinge them. Hypnosis has seldom been used to evoke previous NDEs in an attempt to relieve them; conversely, NDE-like experiences have been induced in hypnosis in the context of psychotherapy with the aim of approximating their transformational therapeutic aspects and facilitating both first- and second-order patient changes.

Fortunately, an increasing dissatisfaction has emerged in recent years with our merely organic medicine, which has been paralleled by a growing interest in consciousness, subjectivity, and spirituality. There is an increasing need to reappraise our paradigm and the still mysterious mind–brain–world relationship; the so-called ASC also call for a broader approach, to reappraise them in a perspective, including their still misunderstood physiology, merging mechanisms, contents, and meanings in a whole without prejudices, not even scientific ones.

Key words: hypnosis, consciousness, consciousness disorders, death, near-death, psychotherapy

Near-death experiences (NDEs) are an intriguing and somewhat awkward topic in the scientific medicine. NDEs can be defined as the memory of impressions during a non-ordinary state of consciousness, including a number of elements such as out-of-body experiences (OBEs), pleasant feelings, seeing a tunnel, a light, deceased relatives, or a life review; these memories are generated during life-threatening conditions, such as cardiac arrest, coma, and shock (van Lommel et al., 2001; van Lommel, 2004; Facco, 2010). Despite all of us having heard anecdotally about these phenomena, usually we are inclined to consider them as doubtful or non-existent; anyway, not relevant, beyond clinical interest, or a matter of brain disorders or hallucination at most. As a result, physicians do not usually ask patients who have survived a life-threatening crisis about NDEs, nor do patients report them to physicians, or even to relatives, for fear of being considered out of mind. Following the first report on NDEs by Moody in the 1970s (Moody, 1977), an increasing interest in their phenomenology and pathophysiology has developed, leading to the publication of a sizable number of papers (Rodin, 1980; Greyson, 1983b, 1993, 2003a, 2003b; Sabom, 1998; Parnia et al., 2001; Parnia & Fenwick, 2002; van Lommel et al., 2001; van Lommel, 2004, 2011; French, 2005; Facco, 2010; Agrillo, 2011, Facco & Agrillo, 2012).

Their incidence, which is higher than commonly believed, as well as their phenomenology, including an awkward transcendent and sometimes even parapsychological tone, make them a relevant and intriguing phenomenon, which challenges the conventional reductionistic and mechanistic view of consciousness and the brain–mind relationship. Therefore, NDEs might help to open a new outlook on the definition of consciousness itself and its pathophysiology. It is a tricky road, involving deep epistemological implications; in fact, errors leading to false conclusions may spring from both an a priori acceptance or refusal of apparently strange and not easily explicable facts.

NDEs also have a relevant impact in clinical practice, since both physicians and psychologists may come into contact with patients reporting NDEs, and their relatives, who may need to understand the meaning of the experience in the process of recovering and coping with their life, and who may benefit from psychotherapy. The ruling mechanistic and reductionistic thinking of primary care givers may lead them to consider NDEs as mere psychiatric symptoms produced by brain disorders, misunderstanding the meaning and relevance of these experiences; instead, it is essential to avoid any a priori judgement and listen to patients respectfully with an open mind, in order to properly understand and help them in the process of integrating their experience into their lives (Griffith, 2009).

When dealing with NDEs, one faces their apparent discrepancy with current opinions on the nature of reality and consciousness, leading to an implicit inclination to neglect them or consider them as a meaningless consequence of organic brain disorders. Instead, despite the exact rate of incidence being unknown, it can be roughly estimated at between 10% and 40% of critical patients and some 5% of the general population (Greyson, 1993 2003a; van Lommel et al., 2001), an incidence which has probably increased in the past few decades thanks to the development of techniques of resuscitation and improved rates of survival and outcome.

Any prejudicial view, of whatever origin, introduces an unacceptable bias, which is likely to be epistemological in nature: it is a crucial problem, since any a priori refusal of facts to protect theories and beliefs inescapably turns scientific knowledge into a theology of paradigm and an imposition of dogma. In most cases, NDEs take place at the boundaries between life and death, between physics and metaphysics. They thus involve a wide and complex range of implications

which do not pertain to science alone (in the more conventional and narrow meaning of the term). In fact, science is by definition limited to the exploration of the physical world only, not the other side of the divide. Our approach to the end of life necessarily calls for philosophy and religion, the latter being a deep philosophical matter to be approached well beyond its narrow doctrinal and dogmatic components.

On the other hand, this means reappraising the meaning of life and death as well as the mind–brain–world relationship, still an unsolved problem, while some 90% of the physical world consists of dark energy and matter which remains scientifically unknown (and probably will remain unknown for a long time) (Wilczek, 2009). Thus, metaphysics is, as a matter of fact, the tissue of the physical world and what we do know is much less than we believe we know. The scientific explanations and philosophical implications of NDEs have been analysed in detail elsewhere (Facco, 2010); here, the phenomenology of NDEs, their epistemological implications, including the problems introduced by language and their relationship with hypnosis, will be shortly outlined.

NDE: PHENOMENOLOGY AND SCIENTIFIC EXPLANATIONS

As already mentioned, NDEs are well-organized experiences reported in a similar way worldwide, across cultures and time (Belanti et al., 2008; Facco, 2010). Their main content can be summarized as follows: (a) getting into a tunnel with or without seeing a light at its end; (b) seeing a Being of Light; (c) OBEs; (d) holographic life review; (e) meeting dead relatives or unknown persons (with possible communication through thought transfer); (f) bliss, unconditional love, peaceful and pleasant feelings; (g) return into the body (usually unpleasant).

NDEs are strong and deep experiences with a clear transcendent tone. Although they mainly occur in critical conditions with a loss of consciousness, they have also been described in normal conditions and role transitions, such as two cases reported during divorce (Gabbard & Twemlow, 1991; Facco & Agrillo, in press). During an NDE, subjects report the perception of being in a non-ordinary dimension, of having trespassed the physical limits of their ego and ordinary space and time flow with clear awareness (Greyson, 2005). The light they see is defined as non-natural or supernatural, while the entities they meet are often not defined (figures of the religion they belong to are present in a minority of cases only); a great bliss and love is often felt, which can reach the mystic tone of full participation and fusion with the whole world (Facco, 2010).

These experiences are usually transformational, leading to an overcoming of the fear of death and to deep changes in their outlook on life and behaviour (Moody, 1977; Greyson, 1985, 1998, 2003a; Parnia et al., 2001; van Lommel et al., 2001; Parnia & Fenwick, 2002). Although these changes are generally positive (Greyson, 1983a, 1983b, 1993, 2003a; Roberts & Owen, 1988; Parnia et al., 2001; van Lommel et al., 2001), in some cases they may give rise to negative after-effects in the process of coping with them, such as social and family problems related to changes in the subject, including an increased risk of divorce (Greyson, 1998, 2001). Therefore, the process of transformation (including improved self-awareness, deeper insight, increased empathy and spirituality, appreciation of life and ordinary things) may be preceded by a difficult transition, during which the new values are properly assimilated. During this period they may need to share their experience with others and/or a psychotherapeutic support, which calls for a proper understanding that is free from any prejudice on the nature of NDEs.

The main scientific explanations of NDE phenomenology are: (a) periphery-to-fovea retinal ischemia as a cause for tunnel vision (Blackmore & Troscianko, 1988; Blackmore, 1996; Nelson et al., 2007); (b) temporal lobe dysfunction, epileptic discharges, and REM sleep intrusions (Cheyne et al., 1999; Britton & Bootzin, 2004; Nelson et al., 2006; Facco, 2010); (c) glutamate-dependent excitotoxic damage (Jansen, 1989, 1990, 2000) and analogies between NDEs and the effects of hallucinogens (for a review see Facco, 2010); (f) multisensory breakdown involving the right angular gyrus for OBEs (Blanke et al., 2004; Blanke & Arzy, 2005; De Ridder et al., 2007; Lopez et al., 2008); (g) psychological hypotheses of afterlife expectation or memories of being born (Blackmore & Troscianko, 1988; Appleby, 1989; French, 2001; Britton & Bootzin, 2004).

All of these interpretations, despite being scientifically sound, remain so far only speculations or, at best, clues without any demonstration, while others are not even plausible or neglect facts incompatible with the ruling mechanistic and reductionistic view (Facco & Agrillo, 2012). Moreover, any interpretation should take into account that the specific content and meaning of an experience cannot be reduced to its hypothetical mechanisms only, although this may be involved in their origin. The mind–brain relationship is not yet properly understood and there is still a substantial lack of explanation on how neural circuit activities may generate qualia and the subjective essence of mind (Chalmers, 1995, 1999; van Lommel, 2004; Facco, 2010). Rather, the reductionistic approach may help in refusing a priori awkward phenomena such as NDEs and unduly relegate them to a meaningless activity, a mere consequence of brain dysfunction.

The hypothesis of NDEs as a by-product of brain dysfunction and/or drug administration is not tenable since the picture of delirium due to brain disorders or drugs (such as acute anticholinergic syndrome) have been well described in anaesthesia and intensive care with a clinical picture entirely different from NDEs (Facco & Rupolo, 2001; Xie & Fang, 2009; Frontera, 2011). Moreover, should NDEs be a mere epiphenomenon of brain dysfunction, a kaleidoscopic array of different fragmented impressions might be expected rather than the lucid, coherent, and well-organized transcultural experiences reported (which might be considered as archetypal, to use Jung's terminology). An amnesia yielded by the insult might be expected as well, cancelling out all impressions (perhaps this might happen to people not reporting NDEs). Indeed, the hypothesized mechanisms might have a trigger role for NDEs, but they cannot be responsible for their specific content or psychological meaning and its transformational consequence. Least of all can it explain other facts like witnessed OBEs.

The phenomenology of NDEs, including OBEs, might be regarded as intrapsychic psychological phenomena, like a sort of dream or hallucination, whatever their pathophysiology. On the other hand, patients reporting OBEs are occasionally able to witness what happened during the loss of consciousness (Sabom, 1998; van Lommel et al., 2001; van Lommel, 2004). The documented evidence of being able to retain a sense of identity, perception, and consciousness while clinically unconscious or in clinical death with a flat EEG (as in cardiac arrest) is surprising, while perceiving oneself as out of one's body and able to witness facts is puzzling and hardly explicable with our current concepts. These cases represent a difficult challenge to the reductionistic and physicalist view, but they cannot be neglected. There are only two possibilities: (a) the cases are fabricated (but this is not tenable) or (b) consciousness might be more than a simple emergent property of brain circuits and have non-local properties. *Tertium non datur*. Facing such a ticklish problem calls for a true sceptical stance; that is, neither

accepting nor refusing anything a priori and avoiding to take scientific (undemonstrated) axioms for absolute truth.

In conclusion, NDEs are outstanding clinical facts with well-documented evidence and epidemiology. A rigorous study of these and other consciousness features might disclose new and unexpected trends leading to a deep reappraisal of the physiology of consciousness and even of its definition; this topic plays a key role in biology, psychology, science, philosophy and, in general, in the whole of human life. Despite the fact that we seem to know almost nothing as yet, a new, still narrow, path looks to be promising: that is, the approach according to relativistic and quantum physics. It provides an entirely new approach to consciousness, despite being hardly understandable in the field of biomedicine, the paradigm of which is still clinging to the physics of the 19th century. The quantum hypotheses of consciousness are as intriguing as they are revolutionary, but they are far from being demonstrated as yet (Hameroff, 1997; Hameroff et al., 2002; Nakagomi, 2003; Smith, 2006, 2009; Ventegodt et al., 2006; Persinger & Koren, 2007). Should they be proved in the future, they would explain the possibility of the non-locality of consciousness, turning NDEs, OBEs, and telepathy into natural and obvious physical facts, instead of implausible phenomena with a paranormal flavour.

EPISTEMOLOGICAL ASPECTS

According to Antiseri and Gava (1983), the history of science is a wonderful story of theories and beliefs disproved by new facts. On the other hand, beliefs (including scientific beliefs and dogmas) are often stronger than facts and behave like powerful filters which prevent us from understanding or even perceiving real facts when they look incompatible with them. As Schopenhauer said, 'Truth arises as a paradox and dies as obviousness'.

It is worth recalling the revolutionary strength of Copernicus and Galileo, up to the discovery of the relativity of time and space by Einstein and the demolition of the paradigm of classical physics by quantum physics. The most recent example of the supremacy of beliefs over facts is the dispute between mechanistic physicists and relativistic/quantum physicists, which led Max Plank to state: 'A new scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die, and a new generation grows up that is familiar with it' (Plank, 1949). It is the timeless human problem, well shaped by the allegory of Plato's Cave.

In general, any new theory has its detractors—they are ubiquitous figures in the history of science. Of course, we should not believe just any new report, but we should be aware of our cultural limits which may prevent us from recognizing true facts. At the beginning of the third millennium, we should be aware that the exclusive use of the ruling mechanistic paradigm is no longer enough and that the relationship between consciousness, language, and the brain—and their relationship with the external and internal worlds—is still far from being fully understood.

Our current paradigm is the result of Cartesianism, Positivism, and the Enlightenment, which have focused mainly on external, objective, material reality, as well as emphasizing the power of reason, intellect, and logic as the most relevant and powerful human faculties. This stance has been of great value and has allowed for the outstanding development of science and knowledge (mostly regarding the so-called *objective* physical world), but it has granted only a partial exploration of reality. The source of bias in this approach rests in its dualistic

essence, which lets one analyse and know only at the cost of separating facts; thus leading to the false belief that reality is the result of separate, frozen facts and mechanisms, where only what we think to be significant is real. Thus, we have developed a utilitarian mind which is able to work very effectively on separated facts to gain advantages but is not inclined to synthesis—perceiving and fitting the complex relationship beyond the products of analysis. In many instances this separation may turn into a dissociative activity, since it arbitrarily separates what in nature is not, with an implicit risk of a sort of cultural schizophrenia.

Galilean science does not spring from a free epistemological reflection, but, on the contrary, is the result of a compromise in Galileo's personal conflict with the Inquisition. This led to the prevention of science from studying the mind and consciousness, since *psyche* has the same etymological meaning as *soul*; thus, consciousness and psyche were disregarded for centuries and relegated to philosophy and religion, and an artificial barrier was created between them and empirical science. It is odd to see how medicine has mainly taken care of patients in terms of Descartes' 'earthern machine', as if the role of mind would be irrelevant in both health and disease.

Where consciousness is concerned, our current position unwittingly meets Cartesian radical dualism—the separation of body and mind—and gives rise to a contradictory stance. In fact, we are inclined to perceive the mind as a strange guest hosted somewhere in the brain but entirely separated from the body; at the same time, we learn to shape our mind as the mere result of brain anatomy and neurochemistry, thus emphasizing only its organic aspect, despite the absence of any clear proof for such an axiom. Fortunately, there is an increasing dissatisfaction with this fragmented and contradictory view, and a movement to find a place for subjective experience in the scientist's world picture (Zeman, 2001). On the other hand, this is to recognize that Positivism has been invaluable in defining the boundaries of the field of investigation, thus withdrawing the often prejudicial influences of philosophy, metaphysics, and religion from empirical science; nevertheless, confined to the *objective*, material world, science has implicitly underscored subjectivity.

We should be aware that we can only get in touch with the external world through our mind and that so-called *objectivity* does not overcome the limit of *shared subjectivity*. Paradoxically, metaphysics is no less realistic than physics, since it is the new reality we necessarily meet when we die, whatever our religious, philosophical, or scientific position. Death looks like a mysterious door (a sort of star gate) which we trespass from our current world towards the unknown, whatever may it be (Nothingness, God, Hell–Heaven, reincarnation, none of them).

In conclusion, our conventional reductionistic and mechanistic approach seems not enough when it comes to defining consciousness, life, death, and near-death (Facco, 2001, 2010; Zeman, 2001; van Lommel, 2004, 2011); their definition is very hard, if at all possible, and necessarily involves physics, psychology, philosophy, and religion, besides biology. Despite our efforts to explain mental processes on an organic basis as the epiphenomena of brain circuits, mind and subjectivity remain the essence of human life to such an extent that withdrawing medical treatment is increasingly allowed in permanent vegetative states, while the very definition of brain death implies that life in itself is *psyche*.

CONSCIOUSNESS AND PSYCHE

The study of consciousness is a difficult multidisciplinary challenge; the term itself has such wide meanings as to make it ambiguous. Consciousness includes a range of both conscious and preconscious processes as well as implicit capacities, selectivity, variability of contents, intentionality, and different aspects of self-consciousness (e.g. awkwardness in the company of others, self-detection, self-recognition, awareness of awareness, self-knowledge). Its complexity has also led to the formulation of several theories in the attempt to define its nature, such as information processing, neurobiology, and social theories (Zeman, 2001).

Consciousness is only the tip of an iceberg, the definition of which is far from complete. Our perception of consciousness is also biased by our prereflexive perception of the ego and cultural traditions, springing from the Cartesian *Cogito ergo sum*. In fact, consciousness is not the foundation of our existence but an evolutionary product; that is, the supernatant of a deep and unknown psychic well working without the need of consciousness. It is worth noting that the Zen tradition considers the Freudian unconscious as a part of the empirical mind (i.e. oriented towards the external world) and belonging to the surface of psyche, while the whole of the unconscious extends as far as the level of Buddha's nature—far beyond the conceptual mind. The latter is a matter of enlightenment which can be reached with the no-mind doctrine and meditation (Sukuki, 1958; Facco, 2010). It is worth noting how western culture discovered only a part of the unconscious just a century ago, while eastern philosophy has known about preconscious and unconscious mind processes for over two thousand years (e.g. the Yoga Sutras of Patanjali).

Western culture, with its emphasis on intellect, logic, and dualism has developed a rather egocentric, anthropocentric, and ethnocentric view of the world, where the usual third-person perspective used in science is often no more than a shared anthropocentric and ethnocentric first-person perspective—perhaps a view not so *objective* as is claimed. It also leans towards a static, mechanistic description of reality, where phenomena are mainly described from the outside, and are not sufficient to understand subjective reality.

Reality is not static; on the contrary it flows in an endless transformation. The psyche and consciousness are also in a ceaseless flux of information and elaboration. Therefore, the concept of *state* in classical physics and the term *state of consciousness* are also errors of the shared first-person perspective, only meaning that no significant change is perceived during the period of observation.

THE DISTORTING LENS OF LANGUAGE

We use a language to communicate with each other, but we must be aware that we are master and slave of our language and culture at the same time: the adopted paradigm allows for understanding a part of reality, but it prevents us from checking and even perceiving facts incompatible with it. Medicine, being focused on diseases and mainly adopting a statistical concept of normality, leans towards defining as dysfunction whatever looks to be different from the most ordinary conditions. Even the disease and its diagnosis are in some way a conventional fact, a noun attached to a wider and often only partly known process (Berganza et al., 2005), the definition of which depends on biological components, psychosocial and cultural frameworks. Such an approach has a strong risk of misconstruing the nature of awkward expressions of mind, with the possibility of taking a non-disorder for disorder (Wakefield, 2010).

In the past few decades, NDEs, hypnosis, relaxation, and meditation have been included in the so-called altered states of consciousness (ASC), together with other physiological and pathological conditions, such as dreaming, sexual activity, starvation, respiratory manoeuvres, sensory deprivation, rhythm-induced trance, dancing, hypnagogic states, epilepsy, the effects of hallucinogens, psychotic symptoms, stupor, coma, and vegetative state (Nichols, 2004; Vaitl et al., 2005; Boveroux et al., 2008). Despite the ASC classification distinguishing physiological from pathological forms, the term *altered states of consciousness* looks to be questionable for physiological and intentional mind activities which do not necessarily imply the features of ASC. In fact, the term *altered* semantically implies the idea of dysfunction, assigning them a bad and unwarranted label of abnormality; on the other hand, the term *state* is inappropriate, since consciousness is a ceaseless processing unit. The term *non-ordinary activity of consciousness* looks to be semantically more appropriate. The very concept of ASC also implies that only what is ordinarily observed can be considered as normal. The same is true for the folk link between genius and madness, since both are beyond the limits of normal; however, the genius and enlightened man lie on the other side of the Gaussian distribution of normality in comparison to the mad.

Names, besides being verbal signs, provide substance to the designated phenomena: they belong to the grammatical category of *substantives*, the etymology of which means indicating or giving substance. The power of names has been well known since the beginning of human kind, since in the Bible it is told: 'So out of the ground the Lord God formed every beast of the field and every bird of the air, and brought them to the man to see what he would call them; and whatever the man called every living creature, that was its name' (Genesis 2:20). And then: 'Come, let us build ourselves a city, and a tower [Ba'bel] with its top in the heavens, and let us make a name for ourselves, lest we be scattered abroad upon the face of the whole earth' (Genesis 11:4).

The power of names and their meanings has strongly conditioned the history of hypnosis, where terms with a pathological or paranormal flavour, such as *magnetism*, *trance*, or *experimental hysteria* (assigned by Charcot) have helped in dismissing it. The same is true for the term ASC when applied to physiological and valuable mind processes like hypnosis and meditation. Where NDEs are concerned, the term ASC helps to perceive them a priori as pathological, skipping their cognitive and transformational potential. Likewise, the terms *hallucinogens* and *psychotomimetics*, used to indicate a class of psychotropic drugs, spring from psychiatric disorders, providing them with strongly negative connotations. On the contrary, shamanic culture considers them as *master plants* able to provide relevant teachings; other more apposite terms for these substances are *psychedelics*, *empathogens*, *entheogens*, and *entactogens*. The term *psychedelic*, introduced by Humphrey Osmond (Osmond, 1957) in the 1950s, emphasizes their capacity to reveal hidden aspects of the psyche, while *empathogens* and *entactogens* indicate their power to generate mystic experiences (increased feelings of participation and fusion with the whole world). *Entheogens*, introduced by Ruck et al. (1979), etymologically means *having God inside* and also denotes the power of fostering mystical experiences with an aspect of religious and divine inspiration (Jaffe, 1990; Nichols, 2004; Facco, 2010).

These examples show how names may give substance and lead us to judge a phenomenon according to its name; this is exactly what the Latin saying *nomen omen* (name is destiny) means. On the other hand, it is worth noting that hallucinogens have accompanied human kind since prehistory and have been always linked to spirituality, from the use of κικεών

(kykeon—the psychotropic drink of the Eleusynian Mysteries) to contemporary native religions and shamanic culture. The solely negative view of modern western culture is likely to depend on its materialistic stance, while master plants in themselves are neither good or evil, but only the use men make of them. Thus addiction is much more a cultural by-product than an unavoidable effect of the substance; this has been clearly shown by opiates, the substances with the highest potential for addiction, and, at the same time, invaluable therapeutic agents with no major risk for addiction when properly used.

Other terms, like hallucination, have been widely used to define both NDEs and aspects of hypnotic phenomenology. This term traditionally provides an instinctive and powerful negative suggestion of mental disease, skipping the fact that both illusions and hallucinations, like hypnagogic and hypnopompic ones, may also be a physiological phenomenon, spontaneously occurring in everyday life. It is worth reappraising the concept of eidetic imagination, a physiological phenomenon allowing us to perceive things that are non-existent in the external reality, in order to regain an awareness of the good, physiological powers of the mind and the limits between its normal and pathological expressions. Creativity is also a unique human virtue enabling us to make real what previously did not exist. A proper reappraisal of physiologic non-ordinary activities of consciousness would be welcome to avoid the verbal shortcuts leading us to implicitly misunderstand the nature of observed phenomena.

In conclusion, the problem of language, and the proper definition of mind activities, has deep cultural implications, since the inclination to render a pathological image of non-ordinary psychic phenomena seems to be a product of the 20th century, dominated by a materialistic and mechanistic view of the world. It is now time to reappraise the foundation of this naive realism and move towards a post-materialist psychology (Greyson, 2010). This will enable us to rediscover the world of subjectivity in medicine, as well as some apparently awkward aspects of mind physiology and spirituality, which are much more real and relevant faculties than was believed in the previous century.

A LINK BETWEEN NDES AND HYPNOSIS

NDEs and hypnosis appear as two entirely distinct phenomena, apart from being linked in the classification of so-called ASC; indeed, they are clearly distinct, but some common processes probably tinge both of them. Experiences similar to those of NDEs can be easily generated during hypnosis, such as: (a) imagining seeing oneself from the outside, (b) changing time perception, (c) recalling old and non-easily accessible memories, up to evoking reminiscences of alleged previous lives, and (d) performing a life review. Of course, there is neither evidence of any likelihood of previous life recollections (Ferracuti et al., 2002) nor do they imply the possibility of reincarnation.

Hypnosis has seldom been used to evoke previous NDEs in an attempt to relive them. The first case was reported in the 1940s (quoted in Holden & MacHovec, 1993) and concerned a man who had previously had a very pleasant NDE during an anaphylactic shock yielded by iodine contrast medium administration for a radiological investigation. The patient was submitted to hypnosis with the direct suggestion of going back to the moment of the NDE. When he recalled it, he underwent a sudden fall of arterial blood pressure with an increase of heart rate up to 190 beats/min, which reversed after de-hypnotization. These data show the psychosomatic power of hypnotic suggestions, which, in this case, replicated the whole

experience including physical changes; this also suggests the potential risks of directly evoking critical situations. Holden and MacHovec (1993) addressed this problem and introduced a hypnotic protocol able to prevent unwelcome somatic reactions related to critical physical conditions during which NDEs are experienced. The way to safely evoke them during hypnosis is essentially characterized by suggesting to the patient that he is to remain in his actual physical conditions while recalling the content of his experience only.

NDE-like experiences may also occur in normal conditions without any real or perceived danger for life, in the absence of psychiatric disorders or psychotropic drug effects, but they still maintain their transformational power (Facco & Agrillo, in press). On the other hand, rites of passage in all cultures may include real risks and/or lead the subject to face the perception of death and rebirth to a new phase of life with increased awareness. In the Bwiti religion (Congo) a complex ritual is still performed nowadays with the use of Iboga, a master plant, under the influence of which subjects have an experience similar to NDEs (Strubelt & Maas, 2008).

The same can be achieved with hypnosis through its capability to induce experiences similar to NDEs. In the context of psychotherapy, Schenk (1999) used hypnotically facilitated waking dreams as an interactive projective technique to generate NDE-like experiences; the aim was to approximate their transformational therapeutic aspects and facilitate both first- and second-order patient changes. Patients were permissively suggested to imagine their life going forward towards its end. Most subjects spontaneously underwent NDE-like experiences, which were not dependent on any previous knowledge of NDEs or personal religious beliefs. The main features of these experiences were a deep sense of well-being, love, and peace in an atmosphere of forgiveness and absence of judgement. OBEs, life review, and the feeling of the presence of a guide, represented as a relevant person for the subject, or a superior entity, might also occur. These experiences, unlike true NDEs, did not end with the return into the body but with the visualization of their out-of-body part disappearing in the light. The life review also had distinct aspects, since during the simulated NDEs what mainly emerged were previous critical episodes; that is, ones which called for being revised in order to allow for a second-order change.

NDE-like experiences seem to have relevant therapeutic implications in achieving second-order changes, leading to positive and durable solutions to patients' problems. This technique looks curiously like the opposite of the usual retrospective psychoanalytic approach, since the past is recollected from the most crucial moment in the future, the projection of one's death, so is a sort of *forward to the past* or *back to the future*. In this envisaged situation, the positive ambience of forgiveness, peace, and love, devoid of any judgement, probably helps towards an equable and effective revision of the patient's problems in a more contemplative view. Perhaps the OBE also allows for keeping a proper distance from the conflicts and helps to revise them in a more detached and meditative way by decreasing the patient's unease. On the other hand, the transformative power of both true NDEs and NDE-like experiences is likely related to their deep meaning and the radical change of perspective they produce in comparison to the limited view of everyday life. This may help to increase the capability to think about life, death, self, and the relationship between self and the external world from a wider and more philosophical perspective, including the very meaning of life and the limited, relative value of social conventions and relationships.

Finally, hypnotically simulated NDEs may help to unearth possible common psychological and physiological aspects with real NDEs; they might lead to a better understanding of their

nature and meaning. Instead, branding them as ASC (together with pathological conditions) prejudicially leads one to distrust and beware of them as mere hallucinatory or psychotic expressions unworthy of interest. There is a still misunderstood link between the phenomenology of NDEs, mystic experiences, vision of prophets and apostles, creativity, inspiration in poetry, art, and music, neurological diseases (such as temporal lobe epilepsy), psychiatric disorders, effects of hallucinogens, role transitions, hypnosis, and meditation (Facco, 2010; Facco & Agrillo, 2012). They probably have in common, at least partially, neurocorrelates which so far have been described in terms of dysfunction and pathology only, while their possible physiology remain still unknown or even mysterious. It calls for a broader interpretation of these phenomena, overcoming the limits of reductionistic interpretations, which are blind to the meaning of experiences, and reappraising the so-called ASC in a physiological perspective by merging their mechanisms, contents, and meanings in a whole without prejudices, not even scientific ones. At the same time, we should be aware of knowing much less than we believe in the field of the mind: consciousness might result in being more complex than we think and, perhaps, might have still unknown properties which look incompatible with the current mechanistic and materialistic approach, anchored to the physics of nineteenth century. It is a hard challenge calling for strong efforts, reappraising our scientific and epistemological ground without accepting or refusing anything a priori.

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