Chapter 8
Can Near Death Experiences Contribute to the Debate on Consciousness?

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Abstract The near death experiences (NDEs) is an altered state of consciousness, which has stereotyped content and emotional experience. Some features of the experience are trans-cultural and suggest either a similar brain mechanism or access to a transcendent reality. Individual features of the experience point more persuasively to transcendence than to simple limited brain mechanisms. Moreover there are, so far, no reductionist explanations which can account satisfactorily for some of the features of the NDE; the apparent "sightedness" in the blind during an NDE, the apparent acquisition after an NDE of psychic and spiritual gifts, together with accounts of healing occurring during an NDE, and the accounts of veridical experience during the resuscitation after a cardiac arrest. Although nonlocal mind would explain many of the NDE features, nonlocality is not yet accepted by mainstream neuroscience so there is a clear explanatory gap between reductionist materialistic explanations and those theories based on a wider understanding of mind suggested by the subjective experience of the NDEr. Only wider theories of mind would be likely candidates to bridge this gap.

8.1 Introduction

It is now almost 40 years since Raymond Moody published his seminal book *Life After Life* (1973). This book described near death experiences (NDEs) and brought these to the attention of both the lay and medical public. Many lay people

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interpreted these experiences as proof of an extension of consciousness beyond death (although Dr. Moody himself never originally claimed this), while those of the medical fraternity with a materialistic understanding of brain function rejected this interpretation and suggested that chemical changes within the brain were entirely responsible for the experiences. Over 13 million copies of the book have been sold, and it has been translated into 26 languages.

8.1.1 History of the NDE and Early Scientific Studies

Descriptions of similar experiences are found in myths and legends going back well over 2,000 years. The most ancient burial sites contain artefacts which suggest belief in the survival of some aspects of the human being after bodily death. Plato (427–347 BC) at the end of the *Republic* tells the story of a soldier who was thought to have died on the battlefield. He revived on his funeral pyre and described a journey out of his body to a place of judgement where souls were sent on to Heaven or to a place of punishment, according to the life they had lived on earth. Before reincarnation they were sent across a river where their experience of heaven was wiped from their memory. Ur himself was sent back to tell others what he had seen.

Noyes (1972) studied the NDE and delineated during the experience sequential stages of resistance, acceptance, and transcendence. Noyes and Slymen (1979), in the first attempt at statistical analysis of NDEs, categorised the experiences slightly differently, and found three general underlying factors: hyperalertness, with speeding up of thoughts and more acute vision and hearing; depersonalisation, with loss of emotion, and an altered sense of the passage of time, together with a feeling that the self was apart or detached from the body and felt strange or unreal. In about a quarter of their subjects they found a further, "mystical" factor, including feelings of great understanding, a sense of harmony and unity, feelings of joy and revelation.

Kenneth Ring, a psychologist at the University of Connecticut, was one of the first people to make a scientific analysis of these experiences. He listed the five features which appeared most commonly and which he found usually occurred in the same order – feelings of peace, the out of body experience, entering darkness, seeing the light and entering the light. This consistent pattern of events he called the "core" NDE. He went on to develop a more detailed scale which included meeting dead relatives, seeing beautiful colors or hearing music, encountering a being or presence and in some cases a "life review." He gave different weights to these features so that an NDE could be scored – the higher the score, the deeper the experience – WCEI, the weighted core experience index (Ring 1980).

Systemisation and standardisation between experimenters became possible when Greyson (1983a, b) applied the standard method of factor analysis to half of his data, and then tested out the weighted data on the second half. From this he was able to develop the Greyson scale, a standard assessment instrument which researchers now use to identify experience's of NDEs for research purposes. The NDE Scale consists of four sets of four questions, which identify cognitive, affective, paranormal, and transcendental NDE features.

8.1.2 Phenomenology of the NDE

The characteristics of the NDE in Western populations are well known. In those who suffer organic trauma, the experience is heralded by calm, which supercedes their pain. A small proportion then say they leave their body and view themselves, usually from a high vantage point. They may then go down a tunnel and enter the light at the end of the tunnel, where there is often a Being of light, with whom they will communicate. Often they may see dead relatives and sometimes a pastoral landscape with exotic flowers, heavenly music, etc. About 12% have a life review. They then progress to a border, which is also a barrier, which they realise is a point of no return. Here something or someone tells them, or they choose, to go back. There is no return journey; they usually "snap" back into their body. The features of an NDE do not necessarily occur in any particular order and not all may be present in a single experience.

Following a TV programme on NDEs in 1987 the author received 2,000 letters from people who had had NDEs. Questionnaires were sent to 500 of those correspondents who were thought to have the most comprehensive NDEs; finally over 450 replies were received. The importance of this data series is that 98% of them had had their experiences before they knew anything about NDEs and thus the series is uncontaminated by expectation, a sample which would be impossible to obtain now.

Calmness	80%
OBE	66%
Tunnel	82%
Being Of Light	50%
Pastoral Landscapes	76%
Meeting Friends/Relatives	38%
Life Review	12%
Barrier	24%
Decision To Return	72%
Transformation	72%
Hellish Experiences	4%

Although in our series people often described a tunnel like the tunnel in a spin dryer hose, many were much less specific and talked about a darkness through which they floated, sometimes with specks of light surrounding them which they interpreted as the light they saw in the distance reflected on the walls of a tunnel. Quite clearly, the description "tunnel" is a portmanteau term which suggests a small light shining in blackness, but it is the movement toward the light which tends to evoke the sensations of a tunnel (Fenwick and Fenwick 1995).

NDE have been found to occur in three completely different situations. First are the standard near-death situations where there is a clear organic component and brain function is significantly altered. Hypoxia and lowered or altered levels of consciousness are the hallmark of this group. For example, they can occur during a cardiac arrest, after a traumatic brain injury, during drowning, childbirth, feverish illnesses, or anaesthesia.

Table 8.1 Estimate of incidences in near death studies, N – population identified for study. n – sample of interviewees. (Permission granted by ABC- CLIO, LLC with thanks), From the handbook of near death experiences pp. 35

Study	Population	N	n	NDEs	Incidence	Criteria
Greyson 1986	Suicides	61	61	16	26%	WCEI
Greyson 2003a, b	Cardiac arrest	1595	116	27	23%	NDE scale
Greyson et al. 2006	Induced card.arr	52	52	0	0%	NDE scale
Milne 1995	Hemodynamic instability	86	42	6	14%	NDE scale
Orne 1995	Cardiac arrest	–	191	44	23%	NDE scale
Pacciolla 1996	Various resusc	125	64	24	38%	NDE scale
Parnia et al. 2001	Cardiac arrest	–	63	4	6%	NDE scale
Ring and Franklin 1981/2	Suicides	–	36	17	47%	WCEI
Schwaninger et al. 2002	Cardiac arrest	174	30	7	23%	NDE scale
Schoenbech and Hocutt 1991	Cardiac arrest	–	11	1	9%	NDE scale
Van Lommel et al. 2001	Cardiac arrest	344	344	62	18%	NDE interview

They can also occur in situations in which the person is not near death at all. They can, for example, be precipitated by extreme anxiety – the so-called "fear death" experience. There is some discussion in the literature whether these should be classified as NDEs or not (see below p.9). Finally there are the spontaneous, transcendent experiences, which have many of the features of the NDE, for example, the presence of love, light, and compassion, the intense animation of nature, sometimes the meeting with dead relatives, and often the impression that the individual is standing in the presence of some transcendent power.

The incidence of NDEs varies widely in different studies, depending on the population. A mean is about 20% – see Table 8.1. The most reliable figures for incidence come from the prospective studies of cardiac arrest, which suggest a figure of about 10% (Parnia et al. 2001; Greyson 2003a, b; van Lommel et al. 2001; Schwaninger et al. 2002).

The first prospective study was a small one, carried out at Southampton General Hospital by Dr. Parnia and his coworkers (Parnia et al. 2001). They asked a number of questions based on their knowledge of the retrospective accounts that were already published. Were the NDEs which were reported by cardiac arrest survivors similar to those which had already been reported in the retrospective literature? Could any clear organic features be likely causative factors in the genesis of the NDE in this very specific situation? Finally, was there any evidence that the OBE during cardiac arrest NDEs was veridical, i.e., when the subject claimed to be hovering just below the ceiling, looking down at the resuscitation situation, could he truly see or was what he reported simply a mind construct of what he would have expected to see? To check this, cards with pictures were placed just below the ceiling so that they would be visible to a patient who was truly seeing while out of his body. In all, there were 63 cardiac arrests and four reported NDEs. When rated on the Greyson scale these gave a score of over 7 and thus fulfilled the criteria for an NDE. The features

of these NDEs was very similar to those already reported in retrospective studies, so the authors felt they could not draw a distinction between the two groups. No clear pathological features were noted in terms of length of resuscitation, drugs, or cardiac pathology, except those with NDEs had a significantly higher level of oxygen than those who did not. This was either a chance finding, or possibly, to be able report an NDE the brain had somehow been working more effectively, which it would probably have done with the increased oxygen levels.

More important, however, was the finding that none of those reporting NDEs had an OBE and thus none of the cards on the ceiling were viewed. The figures from the literature suggest that about a third of those who have NDEs during cardiac arrest also have OBEs, and using this data it was possible to power a future study. To be certain of collecting about 100 NDE experiences in which the subjects had OBEs, approximately 1,500 cardiac arrests would be needed. This would clearly be impossible in a single hospital study of any reasonable duration, and thus a multicenter trial was proposed. This trial was launched by Dr. Parnia in the autumn of 2008 at the United Nations at a conference on consciousness. The study is called AWaRE (awareness during resuscitation). To date 18 hospitals in the UK, two in the USA, one in France, one in Austria, and one possible hospital in Brazil are taking part in the study, and it is hoped more hospitals can be recruited. Approximately 60 cards are put up near to the ceilings in each hospital so that these could be viewed by patients who have a cardiac arrest NDE with an OBE. Data gathering has not yet started, but it is hoped there will be a result within 3 years.

Pim van Lommel's prospective cardiac arrest study of NDEs (2001) was comprehensive, well done, and extended our understanding of the relationship between cardiac arrests and NDEs and their consequences for the patient. Three hundred and forty-four patients in all had cardiac arrests and of these 62 (18%) did report an NDE. The depth of the NDE was classified using the WCEI scale. Very deep experiences were found in 2%, deep NDEs in 5%, moderately deep in a further 5%, some possible recollections in 6%, and 82% had no memory during the cardiac arrest. The characteristics of the NDE were similar to those of previous retrospective studies. A number of factors did not influence the occurrence of the NDE. Amongst these were the duration of the cardiac arrest and of unconsciousness, a complicated resuscitation, religion, etc. Factors that were found to increase the likelihood of an NDE were age (below 60) and previous NDEs. Importantly, those with lasting memory deficits were less likely to report an NDE. Of considerable interest was the finding that patients with deep NDEs were significantly more likely to die within 30 days. Van Lommel also did a comprehensive 2-year and 8-year follow up and found a number of factors on the life-change inventory, which were greater in those who had had an NDE: they were more loving and empathic, more involved with the family, had a stronger sense of the inner meaning of life and an interest in spirituality. Not surprisingly their fear of death decreased and their belief in a life after death increased.

Bruce Greyson studied 116 patients with cardiac arrests and found that 9.5% had reported an NDE with a score 6 or higher on the Greyson scale. A further 6% had memories during the arrest but did not score sufficiently highly to trigger an NDE on the Greyson scale. Again, this study found that the characteristics of the

NDE during a cardiac arrest were similar to the two previous prospective studies and also the retrospective studies. In summary, the author wrote "No one physiological or psychological model by itself explains all the common features of near death experiences…The paradoxical accounts of heightened, lucid awareness and logical thought processes during a period of impaired cerebral perfusion raises particularly perplexing questions for our current understanding of consciousness and its relation to brain function." He went on to suggest that NDEs "challenge the concept that consciousness is localised exclusively in the brain." (Greyson 2003a, b).

A more recent study of cardiac arrest and intensive care survivors has been carried out by Penny Sartori, an intensive care nurse, working in a hospital in Swansea. She found that only 1% of the 243 patients who survived the intensive care had NDEs, but this is not surprising as an intensive care unit has people who are extremely ill and others who come for only a short time just to be stabilised. She did however find 39 cardiac arrest patients, 18% of whom reported an NDE, and a further 5% who reported only an out of body experience without any NDE features, thus bringing the total to 23%. She was therefore able to ask whether the patients who said they left their bodies during the cardiac arrest were able to give a more accurate account of what happened during their resuscitation, than those who did not claim to have left their bodies or to have any memory of seeing the resuscitation. She asked both groups to describe what they thought had happened during their resuscitation and found that those who said they had seen the resuscitation were more accurate in their account of what had occurred than those who were simply guessing. This finding is important as it is the first prospective study which suggests that veridical information may indeed be obtained in some manner by someone who is deeply unconscious and who has none of the cerebral functions which would enable them either to see or to remember.

8.2 Outliers

Some aspects of the NDE – which I shall call outliers – do not fit neatly into a simple mechanistic and deterministic view of consciousness. They suggest that mind should be considered to have direct effects beyond the brain and thus has a non local component.

8.2.1 Wide Conscious States in the NDE Which are Supracultural

An excellent review of the cultural influences can be found in Kellehear (2009). He points out that in Indian, Tibet, Guan, and hunter gatherers of North and South America and Australia, there is no tunnel. The OBE is reported in all cultures apart

from Australian and African hunter gatherers. Life review is seen mainly in Western and Asian cultures, but not in the Pacific areas or with hunter gatherers in the Americas, Australia, and Africa. Beings and other worlds are seen by all cultures. (Corrazza 2008) investigated Japanese NDEs and found that the tunnel was unusual and that often a river and a boatman were the method of transport to the next world.

This varied phenomenology, driven, it would seem, by cultural factors, must raise fundamental questions about the underlying physiology/pathology which gives rise to the features of the NDE. It has been suggested that if there was a mechanism which specifically produced the NDE, then NDEs would be similar across different cultures (Atwater 1988). However, this is a simplistic view, as there is abundant evidence that the content of a mental experience is in itself dependent on the culture in which it arises (Kellehear 2009). Pathological mental states vary widely between individuals and from culture to culture. For example, in toxic confusional states such as intensive care paranoid psychoses, although there may be an overriding paranoid feel to the experience, the actual details of the hallucinatory, delusional, and illusory experiences are determined by the individual and the situation in which the experience occurs (Page and Gough 2010). Thus variability is common and similarity less so.

In the case of the NDE the similarities are thus important and carry a significant weight over and beyond those of the differences. When stripped of cultural features, the phenomena which seem to be universal in the experiences are of "Beings" and the perception of another world. The important question for consciousness research is whether this world, which it seems can be accessed so easily in so many different ways, is fundamentally part of the structure of our consciousness in the same sense that the "real" world is. An alternative view is that the consciousness of these states, which is wider than everyday consciousness, suggests that there is a transcendent realm beyond that of the "ordinary" world to which the NDE has privileged access and which may be more than simply a matter of brain function. This suggests that entry into this world is an expanded form of consciousness.

8.2.2 Lack of a Single Explanatory Brain Mechanism

Should the NDE be described by its phenomenology only, or by the circumstances in which it arises? The variable conditions under which NDEs arise have led to a discussion of those circumstances which are essential for it to be classified as an NDE. For classification as an NDE, the experience must rate at least seven on the Greyson scale (see above). However, the scale takes no account of the circumstances under which the experience arises. As described earlier, NDEs arise from organic causes, e.g., severe brain injury or infection, but similar NDE phenomenology is also found in patients who are ill but not necessarily near death, and those who are not near death but are extremely anxious and "fear death." These psychological "fear death" experiences may occur in situations where the subject is terrified but not injured, such as just before a car accident.

Quite clearly specific mechanisms for the genesis of the NDE which are relevant to damaged brains will play no part in "fear death," transcendent and other NDE experiences, where there is no evidence of brain damage. Fox (2003) compared NDEs with experiences from the archives of the Religious Experience Research Centre at Lampeter UK, choosing those which had the same type of pattern as described by Moody (1973).

8.2.2.1 Moody's Criteria

1. A sense of ineffability after the experience
2. Hearing that they were dead
3. Feelings of peace and quiet
4. Hearing noises such as buzzing and wind-like sounds
5. A sensation of being out of the body
6. Passing through a tunnel
7. Meeting other individuals, often deceased relatives or friends
8. Encountering a Being of light
9. Having a life review
10. Reaching a border, crossing of which meant they would die
11. Finding they had returned to their physical body

After weighing up the evidence for either a similarity or dissimilarity of these wider transcendent experiences, he noted, that the classification of an NDE is "justified up to a point," and as emphasised by Sartori (2008, p. 12). We need to be aware that experiences which meet Moody's criteria can also occur in circumstances and in contexts in which there is no physical threat or danger.

Sartori reinforces Fox's suggested labeling that the experiences should be divided into crisis experiences and noncrisis experiences. Using this classification, Sartori goes on to note that the only NDE features absent from the noncrisis experiences were the border and the life review. It is thus highly unlikely that one single brain mechanism will explain every experience.

A third group of experiences, which are less cohesive and which again have the same phenomenology, are the transcendent experiences which may occur spontaneously during normal waking life. Some transcendent experiences will rate seven or over on the Greyson scale, but their phenomenology is looser than the other two groups described above. In this group of experiences, the subject is nowhere near death and thus the question of whether these are in the same category as NDEs becomes important. A further group are those experiences which again have the same phenomenology as the true NDEs but which occur when the subject is meditating, relaxing, or sometimes even dreaming (Fenwick and Fenwick 1995).

So it is clear that any theory which attributes the NDE to a particular organic process must be wrong, unless it applies only to a clearly defined subgroup, in which case the explanation is only partial. This is well reviewed by Greyson et al. (2009): "The multiple situations in which NDE phenomena arise, and the

lack of a single, simple mechanistic brain-based explanatory system suggests that a wider consciousness framework should be considered." (Sect. 8.4 Models of Consciousness)

8.2.3 Mind Sight

A few people who have lost a primary sense, for example the sense of sight, have reported that they seem able to use this lost sense during an NDE. Adults blind from birth or under the age of five have no visual imagery (Berger et al. 1962). It would therefore be expected that the NDEs of visually deprived people would be significantly different from those of the sighted.

This idea was tested by Ring and Cooper (1999). They obtained 31 legally blind people who had had an NDE or OBE or both. Fourteen were blind from birth, 11 had lost their sight after the age of 5, and 6 were severely visually impaired. Eighty percent of their blind sample, including some who had been blind from birth, reported sighted experience during the NDE. The NDEs of the sample were described as containing the usual NDE components. The authors give a number of case histories, but one of their patients, described as never having had any visual experiences whatsoever, and had not even been able to differentiate light form dark, reportedly had two NDEs. In her second NDE, which followed an automobile accident, she claimed that she had left her body and from a point near the ceiling, had watched medical staff attending to her injuries, and described her floating body as being made of light. She then found herself rising through the roof of the hospital and moving toward the light. She came into an other-worldly pastoral realm where she saw trees, birds, and flowers, and dead friends and relatives. She met "Jesus" who was all light, had a life review, and then came back to her body. Many of the other patients' experiences were similar. Sixty-four percent of the congenitally blind people claimed visual experiences in their NDEs.

A few of their subjects claimed to have obtained visual information when out of their body. One claimed that when her heart had stopped she had seen two acquaintances standing in the hallway, and their presence was confirmed independently by the two people she claimed to have seen. The authors confirmed that NDEs do occur in the blind and are similar to NDEs in sighted people; they have visual impressions and the characteristics of the NDE were to some extent independent of the quality of the subjects' sight. This suggested to the authors that the visual experience could not be following the normal cerebral structures of sighted people. They describe it at one point as "eyeless vision."

The obvious criticism of this study is that blind people use sighted language – i.e., even though they may not see a TV, sitting and listening to it they describe as "watching" it. After examination the authors rejected this. They also discussed, but rejected, the theory that these were visual hallucinations, or an unconsciously generated fantasy that conformed to the subjects' view of what NDEs were like. Their preferred explanation is that the subjects depicted their experience in terms

of visual impressions and that this was due to "mind sight," a transcendental state that allowed them to gather information and reformulate it in a way that they could comprehend.

It has been argued that the NDE experiences are simply dreams. But congenitally blind people and those who lost their sight before the age of 5 have no visual imagery in their dreams. In those blinded at a later age, the visual imagery fades with time. There has been no prospective study to support the suggestion that the blind sighted experiences during an NDE are veridical, but the retrospective accounts from the above authors provide some evidence that they could be. Clearly more studies are required to clarify the issues raised.

If we accept the data from the limited study of Ring and Cooper, then the NDE in the congenitally blind seems to open up a new "sensory pathway," which gathers information without a sensory organ – the authors' "mind sight." This is similar to remote viewing, in which a normally sighted, trained subject is able to gather visual information about a remote target, Schwartz has collected over 80 scientific papers written on this subject, and so there is a scientific data base from which to judge this phenomenon (Schwartz 2011, web site). It seems unlikely that there are two different mechanisms for this similar phenomenon. However, I am unaware of any prospective studies carried out on remote viewing in the blind, so it is not possible to know whether the mechanism is indeed the same. The significance for consciousness research is again clear as it suggests, if the conclusions of Ring and Cooper's study is correct, then that mind must extend nonlocally and obtain information beyond the range of the senses.

8.2.4 Transformation After an NDE

It is not surprising that subjects who have an NDE following a life-threatening event should be transformed by the experience. Any life-threatening event does of course produce change, but the data point toward NDErs being more positively affected by the change than those who had similar life-threatening experiences but had not had an NDE. Greyson (2003a, b) reported on 272 patients who had had a "brush with death," 61 of whom (22%) had had NDEs. They were found to be less psychologically disturbed after the experience than those who had not had NDEs.

Two studies from patients with cardiac arrest are sufficiently comprehensive to make this point. van Lommel et al. (2001) rated the quality of life of subjects post-event, using the Life Change Questionnaire. Changes in social and religious attitude were positively affected. Fear of death was reduced, and search for personal meaning, interest in self-understanding, and appreciation of ordinary things were enhanced (see p. 7). A smaller study by Schwaninger et al. (2002), using the same questionnaire, found essentially the same results. For a full review see Noyes et al. (2009).

A number of factors during and preceding the experience are thought to influence the development, significance, and range of after-effects, including the

circumstances, closeness to death, and – particularly – depth of the experience (Greyson and Stevenson 1980; Schwaninger et al. 2002; van Lommel et al. 2001). There is also a relationship between specific elements of the NDE and its after-effects: the out of body experience, for example, suggests to the experiencers the possibility of continuation of consciousness after death and is a model for the soul leaving the body (amongst others Tiberi 1993). Personality traits may also be important. A number of studies have looked at both pathological and normal psychological characteristics. Essentially, NDErs are indistinguishable from a number of comparison groups as regards their mental health. With regard to nonpathological characteristics, there is some suggestion that the capacity for psychological absorption or fantasy proneness increases the chance of having an NDE, but the evidence is not compelling (Greyson 2000). For a review see Holden et al. (2009, pp. 126–130). However, there is a long history of similar transformation of people who have had a deep transcendent experience, even if it does not fit neatly into the NDE phenomenology (Fox 2003). This suggests that any strong spiritual experience can produce positive spiritual change.

What is of more relevance for this article is that there is also evidence that NDErs report an increase in subsequent paranormal experiences, together with an alteration in perception and consciousness. A number of authors report that following the NDE, there are occurrences of precognition, intuition, guidance, clairvoyance, telepathy, out-of-body experience, and healing ability. Some reported that together with the healing ability, there was perception of other people's auras, and some even claimed to be able to contact spirits. It has been suggested that this is equivalent to the development of psychic awakening. Sutherland (1989) describes the ability of her NDE subjects to come to terms with clairvoyant or precognitive experiences, whereas out of body or telepathic experiences they found disturbing and so tended to suppress them. No study that I know has tested objectively the paranormal claims among NDErs, so their validity remains subjective.

There are also accounts of changes in states of consciousness and in our sample the occurrence of Kundalini-like phenomena (Kundalini is a yoga term indicating an energy source at the base of the spine, which rises through the body producing different sensations and leading to wisdom) reported following the NDE. These usually took the form of shocks or jolts radiating through the body, and the person's knowledge that they were on a progressive path which would be likely to lead to an expansion of consciousness (Fenwick and Fenwick 1995; Noyes et al. 2009).

There are also claims of healing by the experience itself. The most high profile, and controversial, of these is the experience described by Mellon Thomas Benedict, who claims that he was "dead" for 1 h during which he had an NDE, after which he maintains that he was cured of a brain cancer (http://www.mellen-thomas.com/quotes.html). In a good prospective study of intensive care patients and cardiac arrests in the cardiac care unit, Sartori (2008, p. 238) found that 13% of the NDErs in her study reported spontaneous healing following their NDE, whereas none of the control patients did so. One such patient came into hospital after a road traffic accident with chest trauma, a liver tear, and a fractured right humerus. His clinical state was too severe for him to be operated on immediately. When he was finally

discharged to the ward from ITU and the surgeon went to fix the patient's arm, he found that it had already healed. This case was considered by the staff on the ITU to be an unusual event. A second patient had had a contracture of his hand for 60 years, following a mild cerebral palsy and a spastic hemiparesis of his right hand, well documented in the patient's notes and confirmed by his wife and sister. He had an OBE during his NDE in which he found he was able to move his hand normally. Afterwards he found that he was able to move his previously contracted hand normally. This was investigated by a physiotherapy team on the ward who reported that this could not have occurred without special surgery to release the contracture. Thus, the healing of his hand has to be recognised as an NDE healing.

The personality changes, the acquisition of "special gifts," and spontaneous healing unexplained by a direct physical intervention, raise questions about the relationship of consciousness to the body and to the mind which would need to be taken into account in any theory of consciousness. It must be recognised that spontaneous healings are well reported in the literature (O'Regan and Hirschberg 1993) but these are usually seen as interventions by the immune system, leading for example to the regression of cancers. Clearly this mechanism cannot explain all cases and thus the NDE should be seen as a good model for investigating the wider effects of these experiences. In the esoteric and meditation literature, there are frequent references to the development of special powers (the siddhis) after spiritual training or deep spiritual experiences. It would be reasonable to accept that the NDE would count as such a deep experience and thus might also results in changes in subjective experiences.

Although a few people say they have acquired psychic gifts such as telepathic powers, clairvoyance or the ability to heal after an NDE, no studies so far have been carried out to investigate the veridical nature of these claims (Greyson 1983b; Sutherland 1989). Further investigation of these phenomena would be helpful, as if they were validated, a simple mechanistic description of mind would not explain the data.

8.2.5 Claims of Veridical Experience

Veridical perception is well reviewed by Holden (Holden et al. 2009, p. 185), who has found in the literature 107 possible cases of nonphysical veridical perception. She defines it as "any perception, visual, auditory, kinaesthetic, olfactory, and so on – that a person reports having experienced" during an NDE, which is later confirmed by an independent witness and cannot be explained by the normal senses. She describes two kinds of veridical perception, that occurring in the physical domain, e.g., a member of the family speaking in a different room, while the NDEr was ostensibly under an anaesthetic, or in the mental (spiritual) domain, e.g., when the NDEr meets, in his NDE, a relative who has in fact died, though the NDEr does not know this. Out of body perceptions which are claimed to occur at the onset of a cardiac arrest are particularly important for our understanding of consciousness, because they open up the possibility of confirming whether these are indeed veridical. See AWARE study above, Sect. 8.1.2.

Veridical data raises direct questions about the nature of mind. It suggests the possibility that the senses can gather information remotely, i.e., that during an NDE the mind is extended. Examples from our own series include the account given to her parents by a 5-year-old girl after a tonsillectomy operation. She described how the doctors "had funny scissors with long handles and they go snip-snip in your throat." Was this an OBE? It seems highly unlikely that anyone would have tried to prepare a 5-year-old for a tonsillectomy by describing the operation to her in quite such graphic terms, and equally unlikely that she had managed to see the surgical instruments before the operation.

Another convincing account was given by a man who suffered two cardiac arrests while he was in intensive care.

"It was as though I was standing on the wall of the ICU defying gravity and looking down at my own body. I was shocked at what an ugly corpse I was. I was naked and the nurse was taking down a drip out of my ankle. I vividly remember how purple my face was and how blank my forehead seemed. I appeared to have a black triangle from my hairline to my nose. My wife later confirmed that that was how I looked when she was allowed in to see me."

One of the most frequently repeated stories is that of Kimberley Clark, who during her NDE left her body and saw a shoe on a window ledge. Having recovered, she was able to check the window ledge where she did indeed find the shoe. This story has been criticised by Dr. Sue Blackmore, who tried to find Kimberley Clark but was unable to do so and thus felt that the story lacked confirmation. However, I have met Kimberley Clark and she confirms the story. There are already well conducted studies, which suggest that remote viewing occurs in other circumstances (see Sect. 8.2.3). This is further evidence that extended mind may need to be included in any model of consciousness.

8.2.6 Prospective Studies of Cardiac Arrest

Two important outliers occur in NDEs associated with cardiac arrest. Ten percent of patients with cardiac arrests have an NDE (Parnia et al. 2001; van Lommel et al. 2001; Schwaninger et al. 2002; Greyson 2003a, b). Of these, about 30% will have an out of body experience. Cardiac arrest NDEs with out of body experiences are of interest as the experiencers report that while they are unconscious and being resuscitated their sense of subjectivity leaves the body, goes to the ceiling and watches the resuscitation process. However, at that time the brain is nonfunctional, so according to reductionist views of mind, both perception and memory of that perception should be impossible.

There are now one or two possible prospective cases of veridical perception during a cardiac arrest. The most widely discussed, though often disputed, prospective case is that of Pamela Reynolds (Sabom 1998), who was diagnosed with an aneurysm deep within the brain. In order that the surgeons could clip the aneurysm satisfactorily, it was necessary to cool her, stop her heart, empty the blood from her

brain, and then carry out the surgical procedure. During this process she had an OBE in which she was able to identify the cranial saw and a number of other instruments and the operating room personnel. She saw and heard an attempt to insert a catheter unsuccessfully into her right groin, and then successfully into her left groin. Following the OBE, she had an NDE experience in which she saw dead loved ones and was accompanied by her dead uncle who returned her to her body.

Sartori (2008) describes several cases of out of body experience during unconsciousness, some with veridical perception, which support the previous retrospective studies. One patient was making a good recovery following emergency surgery when his blood pressure suddenly dropped and he lost consciousness. He was transferred back to bed while deeply unconscious and not responding to stimuli and remained deeply unconscious for 30 min, not regaining full consciousness for 4 h. During the period of unconsciousness, he had an OBE in which he correctly reported that one of the doctors shone a torch in his eye, that he watched the intensive care nurse clean his mouth and described the instruments she used. He also reported that a physiotherapist put her head around the curtain to find out how he was. All these reports were accurate.

In a cardiac arrest, the three major signs of clinical death are present: no cardiac output, no respiration, and an absence of brainstem reflexes. Yet if NDEers perception at this time is indeed veridical, it is then during this period of the arrest that the NDE experience occurs. It is often argued that even though the clinical signs of brain death are present, the brain state is reversible and thus there may be some small areas of brain which are still functioning and can construct the experience. However, the features of the experience are so wide, containing emotion, visual and auditory, tactile and sometimes olfactory sensations, that no single small brain area would be able to generate the experience. It is also important to note that memory is always affected by severe cerebral disruption, and thus a straightforward explanation using normal cerebral processes is not feasible. Another argument is that the NDE occurs during the onset of unconsciousness, but this is always rapid and thus the experience cannot occur at that time. Eleven seconds after a cardiac arrest, electrical silence supervenes and the brain is totally dysfunctional (Koenig et al. 2006). It has also been suggested that it occurs during the recovery period, but recovery from a cardiac arrest is always confusional and these experiences are lucid. When resuscitation is started, it is unusual for the blood pressure to increase to more than 30 mm Hg, which is not sufficient for the cerebral circulation to be reestablished. The brain does not become functional again until after the heart has restarted. It is difficult to see how a brain which is severely impaired by anoxia and hypercapnoea with distorted electrical transmission would be able to build such clear, lucid, and comprehensive experience as the NDE (Howard et al. 2011).

Any firm conclusion drawn from these experiences must depend on the precise timing of the experience, and thus on the veridical nature of the perception reported. The AWARE study (awareness during resuscitation) is a prospective study, which is setting out to gather cases of NDE out of body experiences during cardiac arrest. Sixty boards with information on have been put up above the beds in the hospitals resuscitation area, in each of over 18 hospitals in the UK and others in Europe and

America, with the aim of collecting over 100 cases of out of body experiences during a cardiac arrest, and testing to see whether the boards have been viewed. This study, run by Dr. Sam Parnia, is the first comprehensive study setting out to examine the nature of consciousness during cardiac arrest. If it can be shown that veridical perception is possible, then the relationship between consciousness and brain function will have to be rethought. (Parnia 2007).

8.3 The Significance of the Outliers

8.3.1 Wide Supracultural Conscious States

The fact that many different cultures have similar content to the NDEs suggests the possibility of a common brain programme which occurs at this time. However, a transcendent realm which may be accessed by the experience could also be important and this would then suggest that consciousness is more than simply a matter of brain function.

8.3.2 Lack of a Single Explanatory Brain Mechanism

No single, simple mechanistic brain-based explanatory system has been found for the many different situations in which NDEs can occur. This suggests that a wider consciousness framework common to all conditions should be considered.

8.3.3 Transformation

The very deep spiritual experience of the NDE suggests that the expression of consciousness by the individual is changed and a number of new spiritual qualities are added.

8.3.4 Veridical Experience and Data from Cardiac Arrest Studies

If veridical data acquired in an NDE can be confirmed, it would indicate that the mind can gather information remotely. This would suggest that during an NDE mind/consciousness may be extended beyond the brain. In this case models based solely on the physical properties of the brain, which limit consciousness to the brain, may need to be widened.

8.4 A Simple Guide to Models of Consciousness

There is no accepted brain mechanism by which subjective experience, or consciousness, can arise from the objective brain structures. Brain neuroscience has advanced to the point where the functions of major areas within the brain are known. Systems of activity during the alert state, resting (the default state), and during sleep and dreaming are all well mapped. Neuroimaging has shown numerous correlates between function and brain areas but it is important to realise that these findings are only correlates. If we feel anger, the left amygdala may well show increased activity, but we do not know how this increased activity translates into the emotion we feel (Adolphs 2008). The gap between objective measurement of the brain and subjective experience has been well shown by the philosopher Nagel (1974) using the example of a bat. However, much we know about the neurophysiological functioning and structure of a bat's brain, its radars and sensory mechanisms, we will never know what it is like *to be* a bat. There is still no answer to Chalmers' "hard problem" (Chalmers 1995, 2010) in that even with our profound objective understanding of brain mechanisms, it is still impossible to get from those to subjective experience. What is it about the NDE that might extend our understanding of the relationship between brain function and consciousness?

Models of consciousness have now become highly sophisticated and are beyond the scope of this article. For a review see *The Handbook of Consciousness* (Velmans and Schneider 2006). However, with our current understanding, there are three basic models.

8.4.1 Reductionist Models

The reductionist models argue that the material world is all there is, and material explanations are the only valid ones. The difficulty with this model is that mind and consciousness are excluded as causal agents. The usual way round this is to use the concept of "emergence," which states that it is impossible to know what new properties will arise from a combination of material substances. Thus it is logical to argue that consciousness itself may emerge with the right configuration of material elements. The usual example given for emergence is the combination of hydrogen and oxygen, both gases, to produce the entirely new substance, water. This is clearly a flawed argument, because both oxygen and hydrogen, when cooled or compressed sufficiently, turn to liquid. Thus liquidity is within their nature. Others have argued that emergence is truly *de novo,* and there is no way of predicting it. If that is so, then the concept of emergence has no scientific value, that is, it is never possible to predict what will emerge, and so find a causative chain of explanation based only in matter. This idea of a causative chain was dealt with by de Haene and Naccache (2001), when they argued that the cognitive neuroscience of consciousness sets out to determine whether there is a systematic form of information processing and a specific and reproducible class of neuronal activation patterns that systematically

(and very importantly) are able to distinguish mental states the subjects label as conscious, from other states which are not. Molyneux (2010) argues that this is purely a referencing problem and not soluble as we lack a procedure for definitely ruling out neurological and theoretical contenders. He argues that neural correlates should not be our only goal, but we must come to understand how mechanisms of a certain sort must produce consciousness. He feels that this will bridge the explanatory gap, but I am not certain that this moves the argument very much further forward.

8.4.2 Consciousness as Primary

The next group of models postulates that consciousness is the basic structure of the universe and that only those models which postulate consciousness as primary can successfully explain the problems facing neuroscience today. Like the first model, this has an inherent flaw – the problem of the explanatory gap. In the reductionist models, a small miracle is needed for consciousness to arise from physical processes; in the consciousness models, the miracle relates to the arising of matter from consciousness itself.

An interesting idea is the possibility of transferring consciousness between physical structures and so extending them to possible receptacles for human consciousness at death. An excellent compendium from the *Journal of Consciousness Studies 2010*, entitled *The Singularity*, considers what would happen if machines became more intelligent than humans and were able to download consciousness in to a mechanical structure. This has many references to the film *The Matrix.* It gives the authors the opportunity to look more closely at the relationship between the neuronal systems of the brain, the physical systems of biology, the evolutionary systems of biological, social, and cultural development and finally the interlinking of these ideas with universal consciousness and the way this may link up with these physical processes.

Chalmers, in an introduction to *The Singularity* asks whether artificial intelligence, (AI) or super artificial intelligence (AI+) can ever reach the point at which brain information can be down-loaded into a new physical structure which will hold our consciousness, so that with the death of the brain we can remain "alive." He argues, as he has before, that the physical structure which carries out all the behaviors of a conscious person is not necessarily conscious, and argues here that there is a difference between biological and functional theories. He says it "is crucial to the practical question of whether (or) not we should upload. If biological theories are correct, uploads cannot be conscious, so we cannot survive consciously in uploaded form. If functionalist theories are correct, uploads almost certainly can be conscious and this obstacle to up-loading is removed… ….. It is true that we have no idea how a non-biological system, such as a silicon computational system, could be conscious. But the fact is that we also have no idea how a biological system such as the neural system could be conscious. The gap is just as wide in both cases" (Chalmers 2010).

8.4.3 Dualistic Models

The third group, dualistic models, postulates that both mind (consciousness) and matter exist as independent entities but are linked closely together. The complexity of the models essentially relates to the degree of linking which is allowed. They can be absolutely linked so that every material element right down to the fundamental particles has consciousness inherent in it. Thus, on one view the particle is material and on another it is an element of mind. These models are attractive as they overcome the difficulty of the emergence of mind from a physical entity or vice versa. But there remains the difficulty of explaining how mind and brain interact and the nature of the mind–brain interface. Simply stating that brain looked at one way is material and looked at another way is mind and that they are closely interlinked still leaves us with the problem of explaining, with our current understanding of neuroscience, how the objective and subjective sides emerge together. Dualistic models echo the current vogue of studying both Eastern and Western psychology, Eastern with meditation and the study of qualitative changes in mental state, and Western which bases its understanding on the behavior and knowledge of physiological processes relating to brain function, and more recently, the recognition that sociobiological factors are important.

Lockley has taken these ideas further, based on exploring Gebser's classic work on consciousness and Goethian ideas relating to the development of biological systems, embedded as they are in an overriding field of consciousness. He argues that these theories, developed in evolving structures, are responsive to a much wider set of influences which condition the way they evolve and the patterns they take. He argues for a cosmic, pranic energy, which conditions the evolutionary forms and is closely linked to universal consciousness itself, thus binding together consciousness and matter into a single system (Lockley 2010).

However, when considering dualistic theories, the most important contribution must come from those who have worked intimately with the human brain and its stimulation during surgical procedures. Wilder Penfield (1970) said "For myself, after a professional lifetime spent in trying to discover how the brain accounts for the mind, it comes as a surprise now to discover, during this final examination of the evidence, that the dualist hypothesis (separation of mind and brain) seems the more reasonable of the two possible explanations…Mind comes into action and goes out of action with the highest brain-mechanism, it is true. But the mind has energy. The form of that energy is different from that of neuronal potentials that travel the axon pathways. There I must leave it."

8.4.4 Field Theories

Field theories have a long history, dating back to Plato who described the idea of a transcendent reality in the *Republic.* He suggested that the life we ordinarily live in the cave (this world) is a reflection of shadows cast, by true transcendent reality

which exists beyond the cave. This idea of ultimate truth existing as the creative background to reality has become the basis for field theories. These theories essentially argue that the wide consciousness of the cosmos underpins all conscious experiences but as it is so wide it is of necessity filtered by the brain. Emmanuel Kant is famous for his distinction between "the thing in itself," i.e., that which is outside the realm of the senses, and "the thing for us," which we can know (*Critique of Pure Reason* 1781). He describes this position as follows: "The body would thus be not the cause of our thinking, but merely a condition restrictive thereof. Though essential to our sensuous and animal consciousness, it may be regarded as an imposition to our pure spiritual life." William James (1842–1910) in his Gifford lectures of 1901–1902, which were later published as *The Varieties of Religious Experience* (1902), also suggested that consciousness could be considered to be a field. James suggested that while ordinarily the brain acts as a reducing agent so that our cognitive perceptions are limited, in transcendent experiences a change in the "filter mechanism" of the brain allows the field of mind to be extended into the transcendent. Field theories are not dualistic theories. They do not argue that brain is one substance and mind another. The field theory argues that individual consciousness is part of universal consciousness and is filtered down so that it can be restricted in its use. Brain substance, rather than being different from universal consciousness, is just another manifestation of it, so you no longer have the difficulty of two substances, which cannot communicate with each other.

Wide transcendent states are experienced to some extent by 30% of the population, and more profoundly in 10% (Hay 1990). In his seminal book, *The Spiritual Nature of Man,* Sir Alastair Hardy describes these states and the Alastair Hardy Centre in the UK has been collecting descriptions of them from the general public (Hardy 1979). An example is given by Nona Coxhead (1985) "…Suddenly the entire room was filled with a great golden light. The whole world was filled with nothing but light. There was nothing anywhere except this effulgent light and my own small kernel of the self. …Extraordinary intuitive insights flashed across my mind. I seemed to comprehend the nature of things. …Neither time nor space existed on this plane…." These transcendent experiences have many of the features of the NDE; the experience is always described as more "real" than that of the everyday universe, which is perceived as alive and conscious.

If we consider that there is a transcendent reality over and above that of the ordinary everyday world, that mind is extended, and consciousness is not limited to the brain, then many of the outliers of the NDE which are described above fall easily into place. The presence of a transcendent world which is supra-cultural and the ease with which it can be accessed fits well. An extended mind, again shown by the NDE, will also fit well into this model. Provided the transcendent is given priority in a causal sense, then healing and transformation of the personality with supra-sensory gifts after an NDE could also be accounted for. The major benefit of these theories is that they are nonlocal. The transcendent mind is universal and the individual mind has access to it. Thus if this is so it is not surprising that the NDE points to the lack of theories relating to consciousness within the brain and our inability to find the neural basis of consciousness, which is of course much wider and includes a transcendent component. Mindsight and veridical experience are also more easily

explained using a holistic transcendent framework. But importantly, a field transcendent theory postulates a universe, which is much closer to that experienced by the NDErs than the one that can be accounted for by the shuffling about of our current, limited reductionist neuronal correlate theories.

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