

The Importance of the Exceptional in Tackling Riddles of Consciousness and Unusual Episodes of Lucidity

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Abstract: The problem of how biochemical processes in the brain give rise to conscious experience is still unanswered. This paper aims at stimulating the debate surrounding this enigma by advocating the study of unusual and anomalous aspects of consciousness. For this purpose, the contents of this paper are organized in three parts. In the first part, I provide a brief overview on unsolved riddles of the mind. These include unusual episodes of lucidity that have been termed terminal lucidity and paradoxical lucidity. Because the use of these terms has sometimes been inappropriate in recent literature, I clarify the basic meanings of these two concepts in the second part. The third part contains suggestions for future research. Specifically, I argue that the field of studies into episodes of lucidity in dementias and the field of studies into end-of-life experiences, such as near-death visions, should engage in an active dialogue in order to build bridges between these disciplines. Such a dialogue will enable a better understanding of the whole spectrum, and thus, possible circumstances, causes and underpinnings of lucid episodes. In sum, this paper argues that the study of lucid episodes such as terminal lucidity, paradoxical lucidity, and related occurrences holds enormous significance for improving our understanding of brain functions and accompanying states of consciousness – from a practice-orientated perspective in the contexts of the dementias and dealing with end-of-life experiences, and from a theoretical perspective in the context of the scientific debate about the nature of consciousness.

Keywords: Consciousness, terminal lucidity, paradoxical lucidity, dementia, Alzheimer's disease, end-of-life experiences, near-death visions

Highlights

- This paper argues that studying anomalies in consciousness research can contribute significantly to advancing the debate on consciousness.
- Various unusual and anomalous phenomena are addressed in this paper
- The concepts of terminal lucidity and paradoxical lucidity need to be reconceived.
- This paper proposes building a bridge between the fields of studies into dementia diseases and end-of-life experiences.

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In 1872, pioneering physiologist Emil du Bois-Reymond (1818–1896) proclaimed his famous verdict regarding the question of how the behaviour of inanimate atoms of carbon, hydrogen or oxygen in the brain can give rise to phenomenal conscious experience: “Ignorabimus!” [We will never know!]” (du Bois-Reymond, 1872, p. 33). Since that time, neuroscientists have achieved tremendous progress with regard to elucidating neuronal correlates of consciousness. But still, the question of how exactly consciousness is related to the arrangement of matter in the brain has remained unanswered. In fact, discussions revolving around this topic have gained renewed momentum during recent years even in mainstream settings, especially among philosophers (e.g., Brüntrup, 2018; Chalmers, 2020a). Most of these philosophical discussions are theory-centred and continue to address the general problem of how and why physical processes in the brain give rise to conscious experience, i.e., they address what philosopher David Chalmers termed “the hard problem of consciousness” (Chalmers, 1995, 2020b). However, there exist a number of puzzling but empirically documented facets of consciousness that hold the potential to enrich and further these theoretical speculations about the relation of the mind and the brain from a practice-orientated perspective. In the following sections of this paper, I aim at contributing to this debate by highlighting such puzzling facets of the human mind, putting a specific focus on unusual episodes of mental lucidity. The paper consists of three parts. First, I provide a brief overview on some of the mentioned riddles of the mind. Second, because a proper understanding of phenomena that are to be investigated is indispensable for moving a field forward without creating confusion, I clarify the basic meanings of two different concepts of lucid episodes that have been misrepresented in recent publications: terminal lucidity and paradoxical lucidity. I also present considerations as to how the general concept of “episodes of lucidity” should best be understood. In the third part, I present suggestions for future research. Specifically, I argue that the field of studies into episodes of lucidity in dementias and the field of studies into end-of-life experiences should engage in an active dialogue in order to build bridges between these



disciplines. Such a dialogue will allow for a better understanding of the whole spectrum, and thus, possible causes and underpinnings of lucid episodes. In sum, I maintain that assessing unusual cases of apparent discrepancies between states of consciousness and correlated brain conditions is of vital importance for advancing our understanding of consciousness under normal conditions, and will contribute significantly to the debate on the hard problem of consciousness.

Overview of some Riddles of the Mind

One of the mentioned puzzles of consciousness consists in the well-documented effect that thoughts, feelings, beliefs, and volition can affect the biology of the brain and can literally change its neuronal and anatomical structure. Numerous empirical studies therefore support the view that self-induced mental activities, even sustained ordinary learning processes, do influence the brain’s organization and plasticity (Beauregard, 2007, 2021). This finding seems difficult to reconcile with the standard notion in mainstream neuroscience according to which human consciousness is only a passive by-product of the brain’s biochemistry and is principally unable to affect the brain. But mental states can furthermore affect the biology of bodily structures and functioning outside the brain, as exemplified by placebo and nocebo effects as well as somatic and physiological changes resulting from the influence of changing sub-personalities (“alters”) in people with dissociative identity disorder (DID). Depending on which alter is “in control”, somatic differences in one and the same body have been observed already in virtually every organ of the body (Coons, 1988). This may concern brain activity patterns (Schlumpf et al., 2014), skin characteristics, blood pressures, the presence or absence of allergies, diabetes symptoms, drug and intoxication sensitivities, or optical changes including colour vision and visual acuity (Kelly, 2007). In a recent case report, states of profound psychogenic blindness in one alter could switch within seconds to normal sight in another (Strasburger & Waldvogel, 2015). Similar phenomena that imply deliberate con-

control over usually autonomic processes can be induced via hypnotic suggestions or meditation training. Remarkable examples are constituted by purposefully induced changes in body temperature and heart rate, the hypnotic induction of skin burns, blisters, bleedings, allergies, or breast enlargements (Kelly, 2007, Nahm, 2012). It is presently unexplained how such somatic changes can be generated in response to a mental stimulus.

Other riddles of consciousness concern unusual discrepancies between cerebral structures or physiological processes and cognitive faculties accompanying such states. Examples of these discrepancies are constituted by people with gross malformation of the micro- and the macro-anatomy of brain tissues, such as in people with extreme hydrocephalus who nevertheless lead a normal life and may even score higher than the average in intelligence tests. Similarly, people who were born with only one brain hemisphere but who do not seem to differ from those living with two hemispheres regarding their motor and mental abilities pose challenges for the notion that the evolution of human intelligence was only possible because of the evolution of two large and complicatedly structured hemispheres. Even more perplexingly, the mental faculties including memory recall of people who had one of their hemispheres surgically removed is usually hardly impaired after this drastic operation, if at all. Curiously, it has already been observed that removing an entire damaged hemisphere results in considerably less mental impairment than removing only damaged parts of a hemisphere (for a review of these topics, see Nahm et al., 2017). Moreover, several savants possessed extraordinary memory capacities that need to be taken into account when developing theories of memory functioning, and therefore, also of consciousness. We know of savants who could remember and re-play complex piano pieces without mistake after having heard them only once, and savant Kim Peek (1951–2009) remembered the contents of more than 12,000 books – apparently verbatim. Usually, he would read one page in eight to ten seconds, and he even read two pages of smaller books such as paperbacks simultaneously, using one eye

each for each page (Treffert, 2010). Given that the storage of long-term memories in the brain is thought to entail the synthesis of proteins (a process that takes at least several seconds), it is unclear from a neurophysiological perspective how assumed physical memory traces of most minute details of complex piano pieces or of entire books could be stored indelibly in the savants' long-term memory immediately upon perceiving their very swift and non-recurring flow through sensory channels – a question that has, to my knowledge, not yet been addressed in memory research. The outstanding abilities of Kim Peek are particularly remarkable as he possessed a severely malformed brain (Treffert & Christensen, 2005). Other discrepancies between brain states and cognitive functioning are reported from near-death experiences (NDEs). In these experiences, people undergoing life-threatening crises, for example after a cardiac arrest when the brain is severely deprived of oxygen, sometimes report having experienced profound episodes of mental lucidity and memory recall that are at odds with the severely compromised brain state (Rivas et al., 2016; van Lommel, 2021; see also Parnia et al., 2014). The sometimes-heard argument that these experiences must actually have taken place before or after the breakdown of cortical network activities is problematic for a number of reasons and called into question by empirical evidence (Nahm & Weibel, 2020).

In the remainder of this publication, however, I will focus on another unusual type of lucidity that occurs in near-death states and that has been referred to as “lightening up before death” (Macleod, 2009) and “terminal lucidity” (Nahm, 2009; Nahm & Greyson, 2009). In such cases, moribund people display an unexpected surge of mental clarity shortly before dying. The most peculiar cases occur in patients suffering from mental disability including mental illness and brain conditions that involve severe neurodegeneration, such as strokes, brain tumours, and neurodegenerative dementias like Alzheimer's disease. In drastic instances, people who have not recognized family members or caregivers for years, and have not spoken for that time, suddenly sit up in their bed, being

brightly aware, recognize their kin again, remember their life, speak coherently again – and die within the next seconds, minutes, or hours (Nahm, 2009, 2012, Nahm et al., 2012). Terminal lucidity can also go hand in hand with so-called near-death visions or deathbed visions – visions of spiritual figures or deceased loved ones that seem to prepare the moribund for their transition, or visions that appear like glimpses into a spiritual afterlife realm (Osis & Haraldsson, 1977, 2012; see below).

Judging on the available literature on these near-death phenomena, it seems that consciousness can remain intact, or can even be enhanced, under a variety of compromising brain conditions, and that furthermore, also unusual episodes of lucidity can occur under a variety of different brain conditions. In conjunction with the other riddles of the mind, these observations highlight the significance of lucid episodes, especially those occurring at the end of life, for elaborating an improved understanding of the nature of consciousness and its relation to neurophysiological brain states. In this respect, it is a promising development that the general and scientific interest in episodes of lucidity has grown substantially in recent years. In the scientific context, this is particularly evident in dementia research, and here especially in the USA. Following initial publications that highlighted new fields of research in dementia diseases (Eldadah et al., 2019; Mashour et al., 2019), six research projects with a funding volume of about two million dollars have lately been launched by the National Institute of Health (NIH, 2020). Furthermore, several recent publications have examined lucid episodes in dementias from different angles (Bostanciklioğlu, 2021; Gilmore–Bykovskiy et al., 2021; Morris & Bulman, 2020, 2021; Ney et al., 2021; Peterson et al., 2021). However, there seems to exist uncertainty regarding the precise understanding of the concept of terminal lucidity. Because the correct understanding of its meaning is indispensable for the proper advancement of research into lucid episodes and misrepresentative notions should not gain traction, I will now turn to elucidating the concept of terminal lucidity and some related terms.

Clarifying Concepts

What is Terminal Lucidity?

The mentioned uncertainty regarding the precise meaning of the concept of terminal lucidity originates in part from imprecise characterisations of this term in my own publications. In 2009, Bruce Greyson and I described it in general terms as “the unexpected return of mental clarity and memory shortly before death”, emphasising that the most remarkable cases involve people who suffered from mental illness (Nahm & Greyson, 2009). In the same year, Erlendur Haraldsson and I described terminal lucidity similarly as the marked decrease of mental confusion shortly before death. We stressed that this increase in mental faculties is particularly remarkable in mentally ill or impaired people (Nahm & Haraldsson, 2009). Also in another paper, I referred to terminal lucidity broadly as “the sudden return of mental clarity shortly before death” (Nahm, 2009) and highlighted that the most peculiar cases involve people who suffered from mental impairments, including dementia diseases. In various other publications, I have also characterised terminal lucidity in this sense (e. g., Nahm, 2011, 2012, 2013, 2017). In two publications, however, my co-authors and I described terminal lucidity more narrowly, namely as the unexpected return of mental clarity and memory shortly before death in patients suffering from severe psychiatric and neurological disorders (Nahm & Greyson, 2014; Nahm et al., 2012). This exclusive focus on people with psychiatric and neurological disorders was inadvertent, however, and is in effect misleading. Terminal lucidity can also occur in drowsy or confused people who die with healthy brains. Moreover, unexpected mental clarity shortly before death can even occur in people born with mental disabilities (Nahm & Greyson, 2014). In such cases, it is inapt to speak of an unexpected “return” of mental clarity as the observed mental clarity might have never existed before. Because of these ambiguities in my publications and inappropriate treatments of the concept of terminal

lucidity also by other authors (see below), I made it clear in a recent publication that terminal lucidity refers to “any kind of unusually enhanced mental clarity before death” (Nahm, 2022, p. 1).

The Distinction Between Terminal and Paradoxical Lucidity

In my extensive compilation of case reports of unusual episodes of lucidity (Nahm, 2012), I also referred to reports of remarkable episodes of lucidity in patients with advanced dementias that had occurred weeks or months before their death and therefore had apparently no relation to dying. In order to avoid fostering the probably unwarranted notion that all episodes of unusual lucidity, especially in advanced dementia diseases, are related to dying, a team of authors including myself introduced the concept and term of “paradoxical lucidity” into the literature (Mashour et al., 2019). In short, the difference between the two concepts of terminal and paradoxical lucidity is this (Nahm, 2022):

The term “paradoxical” is a qualitative and state-related attribute that, in principle, says nothing about the time at which a lucid episode occurs in the course of a neurodegenerative process. However, it implies the presence of a pathophysiological, neurodegenerative brain condition that does not seem to be consistent with the observed mental lucidity. This is why it is considered “paradoxical.”

The term “terminal”, on the other hand, is a time- and process-related attribute that, in principle, says nothing about the brain state of a dying person and the potential paradoxicalness of an episode of lucidity. It can occur in patients with or without brain conditions. However, the unexpected episode of lucidity always occurs relatively shortly before death.

Hence, both terms refer to different aspects of lucid episodes. Nevertheless, an overlap between the two concepts occurs quite naturally when, for example, patients

suffering from severe neurological damage display an unusual episode of lucidity shortly before their death. In such cases, both terms fit and one could even speak of “paradoxical terminal lucidity.” Mehmet Bostanciklioğlu (2021) has already used this formulation, but only casually and without explaining the rationale behind using these terms in this manner. In fact, he used the terms terminal lucidity and paradoxical lucidity largely interchangeably in his article, but seemed to regard terminal lucidity as a kind of umbrella term with paradoxical lucidity being a property of terminal lucidity. As explained above, however, this generalization is inapt because paradoxical lucidity does not necessarily occur close to death. Moreover, another team of authors reversely considered paradoxical lucidity as an umbrella term and claimed that all cases of terminal lucidity should be considered instances of paradoxical lucidity (Peterson et al., 2021). However, this notion is likewise inapt because terminal lucidity does not always involve severe neurodegenerative conditions that would render its occurrence paradoxical (Nahm, 2022).

Terminal vs. Paradoxical Lucidity: Further Clarifications

Commenting on my clarification of the matters (Nahm, 2022), Peterson et al. (2022) nevertheless repeated their proposition that all cases of terminal lucidity must be regarded as instances of paradoxical lucidity. They argued there would be no evidence for terminal lucidity in people without psychiatric or neurological brain conditions – not even in my own publications. I address their claims below.

1) Unexpected surges of enhanced mental clarity in people shortly before dying have been reported for ages and across cultures (e. g., Lim et al., 2020; Nahm, 2012; Macleod, 2009; Schreiber & Bennett, 2014). To the best of my knowledge, nobody except Peterson and his team has ever claimed that these surges are only known from subjects suffering from brain conditions. In fact, already medical standard literature on unexpected mental clarity before death contains cases that did not involve brain conditions.



For example, some of the patients described by Lim et al. (2020) and Macleod (2009) obviously had no brain conditions; the latter publication contains in addition a reference to a particularly instructive case of a soldier who had lost a leg and succumbed to this injury. Moreover, even my own publications do contain several examples of people who displayed terminal lucidity but had no brain condition. One report concerns the mother of the formerly renowned German philosopher Hans Driesch (1867–1941; Krall et al., 2021), who died of peritonitis (Driesch, 1951). After uttering only unintelligible words during previous hours, she finally slipped into sleep and unconsciousness. She was expected to die soon. Yet, to the amazement of those present, she suddenly awoke again to bright awareness and spoke about what she experienced during the time of her unconsciousness. But this episode of lucidity lasted only briefly. She became unconscious again and died shortly afterwards (Nahm, 2009, 2012). Judging upon Peterson et al.'s (2021) first criteria for determining the potential paradoxicalness of a lucid episode, namely (1) the type of the neurological condition and (2) the irreversibility of the neurological condition, this woman's surge of mental clarity before death clearly does not qualify as paradoxical lucidity because a neurological condition did not even exist. Elsewhere, I described four other cases of terminal lucidity that seemingly did not involve brain conditions (Nahm, 2012).

2) In order to support their argument that there would be no evidence for terminal lucidity in people without brain conditions even in my own publications, Peterson et al. (2022) referred to the two already mentioned publications in which terminal lucidity was introduced as the unexpected return of mental clarity before death in patients suffering from psychiatric and neurologic disorders (Nahm & Greyson, 2014; Nahm et al., 2012). Simultaneously, they disregarded all other sources in which my co-authors and I defined terminal lucidity in general terms and in agreement with my clarification. Yet, selecting a specific minority of past formulations that convey an obsolete notion which I have al-

ready corrected appears inapt, especially as my clarification was explicitly written to prevent further inappropriate usage of the terms terminal and paradoxical lucidity: "Realizing that the matters have so far not been expressed with appropriate precision in previous publications, *including my own*, I explain below how these two terms were originally conceptualized and should be understood" (Nahm, 2022, p. 1; emphasis added). Authors concerned with my understanding of terminal lucidity should therefore refer to this clarification and to previous publications that match its content.

3) Peterson's co-author Jason Karlawish has recently, together with me and other authors, discussed surges of neurophysiological activity in the brains of rodents who died *without* neurological conditions as a possible mechanism for paradoxical lucidity in patients who die *with* neurological conditions. We argued that "some patients with severe dementia might also experience a surge of neurophysiological activity before death, which is manifested as a lucid episode" (Mashour et al., 2019, p. 3)². But because such surges in rodents without neurological conditions would be even more likely to occur also in humans without neurological conditions, one wonders *a fortiori* on what grounds Karlawish and his co-authors deny the existence of evidence for terminal lucidity in people without neurological conditions (Peterson et al., 2022).

² Apart from rodents, unusual neurophysiological activity around the time of dying has also been reported from humans in several studies already (Auyong et al., 2010; Barbato, 2001; Barbato et al., 2017; Chawla et al., 2009, 2017; Gambrell, 2005; Masman et al., 2016; Norton et al., 2017; Vicente et al., 2022). It is still debated how these neurophysiological activities can be interpreted (Greyson et al., 2013, 2022; Norton et al., 2017). Nevertheless, it is reasonable to assume that instances of terminal and paradoxical lucidity will typically go hand in hand with changes in neuronal activity. Already Barbato (2001) had reported a case of a woman who awoke after a prolonged period of unconsciousness and spoke to her family. The measured brain activity increased considerably during this lucid episode. She died hours later. According to Barbato (2001, p. 106), such increases in neurophysiological activity could "validate the not infrequent observations that patients may open their eyes, stare, or take a deep sigh at the point of death."



Nevertheless, I agree with Peterson et al. (2022) in that the characterization of terminal lucidity as occurring “before death” or “shortly before death” is not (yet) properly elaborated and open to subjective line-drawing. This precisely mirrors the situation regarding the term “paradoxical” and constitutes one reason why I used gradual shading to illustrate the onset of terminal and paradoxical lucidity episodes in Fig. 1 of my previous publication instead of using a line or an abrupt onset of colouration (Nahm, 2022). The current lack of widely approved elaborate definitions does not, however, question the overall validity of these two concepts. Rather, it is my hope that just as researchers are now attempting to define the term “paradoxical” more precisely in the context of research projects addressing lucid episodes in dementias, a refined definition of the term “terminal” will also be developed in future. Peterson et al. (2022) furthermore criticized

that a “causal story relating the dying process to the lucid moment” is lacking in my current definition of terminal lucidity. Again, I agree with them in that such a causal relation needs to be captured in refined future definitions – and in fact, my explicit characterization of terminal lucidity being “process-related” (Nahm, 2022) implied a causal relation already. Hence, in contrast to what Peterson et al. suggested, being killed accidentally after displaying an unexpected episode of lucidity, as the subject in a hypothetical example they presented, does not match my criteria for terminal lucidity. There is no appropriate process-relation between a fatal accident and an unrelated lucid episode that occurred before this accident.

To conclude this section, I would like to emphasize that a proper and consistent use of well-defined basic terms is very important to avoid misunderstandings or the development of ambiguous concepts in the nascent field of research into lucid episodes. This obviously includes also general terms such as “lucid episodes” and “episodes of lucidity”. In a recent publication, for example, Patricia Morris and Donna Bulman (2020) explicitly

equaled the term “lucid episodes” with “paradoxical lucidity” in their publication’s Abstract. Throughout their paper’s text, they continued to focus on lucidity in advanced neurodegenerative disorders – but they also admitted that the term “lucidity” is used in diverse ways and they even referred to one of my publications in which “terminal lucidity” was introduced in general terms, i.e. without implying paradoxicalness (Nahm, 2009). Hence, equalling lucid episodes explicitly with paradoxical lucidity without further explanation does not seem to be apt because paradoxical lucidity only refers to lucid episodes in patients who are assumed “to have permanently lost the capacity for coherent verbal or behavioral interaction due to a progressive and pathophysiologic dementing process” (Mashour et al., 2019, p. 1107). Using the terms “lucid episodes” and “episodes of lucidity” in a more general sense appears more apposite since “good days” and “bad days” with regard to mental clarity, or fluctuations of cognition and awareness, are known to occur also at earlier stages of numerous neurological and psychiatric conditions including dementia diseases and brain injuries (Ballard et al., 2001; Gardner, 1976; Lee et al., 2014). A suitable general definition for episodes of lucidity that does not automatically imply paradoxicalness and that can therefore be used in various contexts was provided by Normann et al. (1998, 2006):

An “episode of lucidity is an episode when the resident unexpectedly speaks or acts in a way that surprises the care providers because the resident seems to be much more aware of her/his situation and to function much more adequately than usual” (Normann et al. 2006, p. 1415).

Characterizing paradoxical lucidity, that is episodes of lucidity in the context of advanced neurodegenerative disorders, would then require additional specifications, such as the “key attributes” suggested by Morris and Bulman (2020).

Suggestions for Future Research

After having (hopefully) created increased terminological lucidity, I will now add two suggestions for further research into lucid episodes.

A Plea for Bridging the Fields of Dementia Research and Near-Death Studies

My first suggestion consists in taking end-of-life experiences (ELEs) into account in future research on paradoxical (terminal) lucidity. At present, it is my impression that scientists specialized in dementia diseases are not very familiar with the large and continuously increasing body of research concerning ELEs. In addition to terminal lucidity, ELEs cover a considerable spectrum of unusual incidents reported from the last phase of life. They have been reported for centuries and are not uncommon. On the side of the moribund person, they include visions of deceased loved ones or religious figures who appear to prepare the dying for their transition (near-death visions or deathbed visions), vivid and usually comforting dreams of similar content, perceiving unusual luminous phenomena or hearing inexplicable music, and an unexpected appetite and desire to eat. On the side of the bystanders, they include the sharing of near-death visions (shared death experiences), perceiving unusual lights or music as well, noticing synchronistic events such as the stopping of clocks and malfunctioning of electronic devices, or in case of absence, the distinct sensation that the moribund person has just passed away (for a selection of academic sources on ELEs from only recent years, see e. g. Claxton-Oldfield et al., 2020; Claxton-Oldfield & Dunnett, 2018; Claxton-Oldfield & Richard, 2020; Depner et al., 2020; Grant et al., 2020, 2021; Klein et al., 2018; Levy et al., 2020; Lim et al., 2020; Renz et al., 2018; Shared Crossing Research Initiative [SCRI], 2021, 2022). Although some of these phenomena are likely to be dismissed as irrelevant or hallucinatory by some, building bridges between the field of research into paradoxical lucidity in dementias and the field of ELEs is essential for facilitating knowledge exchange. In its current state, the absence of such a bridge might hamper constructive collaborations and even cause setbacks of the re-

search progress. For example, had Peterson and his research team (Peterson et al., 2021, 2022) been familiar with some of the basic literature on ELEs, they could have known that terminal lucidity does also occur naturally in people who die without brain conditions, and would presumably not have propagated their claim that all episodes of terminal lucidity must be regarded paradoxical. Moreover, in the descriptions of the six research projects on lucid episodes in dementias funded by the NIH (2020), as well as in respective publications that have since been published by dementia specialists (see above), ELEs apart from terminal lucidity have not been mentioned. Although this comparably narrow focus is comprehensible in this initial phase of research, it is likely that an optimal understanding of paradoxical terminal lucidity, and perhaps also of paradoxical lucidity as a whole, can best be obtained if researchers studying lucid episodes familiarize themselves with ELEs and take them into explicit account when trying to identify the concomitant circumstances, conditions, triggers, and underpinnings of paradoxical (terminal) lucidity.

A Plea for Studying Unusual Cases

My second suggestion is closely related to the first and consists in a plea for searching and documenting particularly unusual episodes of lucidity. For example, professional studies in the field of dementia research that also address spiritual and anomalous aspects of lucid episodes could serve as an immensely valuable source for enhancing our knowledge about states of consciousness near the end of life. Take, for example, near-death visions, which have attracted increased academic interest in recent years (e.g., Claxton-Oldfield & Dunnett, 2018; Dam, 2016; Kellehear et al., 2011; Kerr et al., 2014; Morita et al., 2016; Muthumana et al., 2010; Nosek et al., 2015; dos Santos et al., 2017; SRCI, 2022). Such visions often go hand in hand with terminal and even paradoxical terminal lucidity (Nahm, 2012; Nahm et al., 2012). From the standard medical perspective, they are typically regarded as being driven by psychological needs or the physiology of the dying brain.

Nevertheless, many of the available reports are still remarkable, especially in case they concern patients with end-stage dementia, such as in the following account:

Mr. Sykes, an elderly man in the final stage of Alzheimer's disease, lapsed into an almost vegetative state two months before his death. He did not know where he was nor did he recognize his wife or children. He could not talk coherently and gave no sign of understanding anything about his circumstances. One day, however, "he sat up in bed and spoke as clear as a bell, talking just like anyone would, but not addressing us. He was looking upward with bright eyes and carrying on a conversation with 'Hugh'. He spoke loud and clear to Hugh, sometimes laughing but usually just conversing as though the two were sitting in a coffee shop having a chat." Mr. Sykes died later that day. It turned out that Hugh was a brother of his who was considered alive and well, but who had in fact died from a heart attack right about the time that Mr. Sykes "miraculously came back to life." (Moody, 2010, p. 15f)

This is a truly extraordinary report, but near-death visions that go hand in hand with enhanced mental clarity in patients with severe neurodegeneration have been reported already a number of times and I see no reason to question their authenticity as a whole. From a neurophysiological perspective, the significance of these reports is twofold. 1) Episodes in which severely demented or nonresponsive patients suddenly become alert and recognize people who appear in visions, and even talk to them in a coherent manner, are just as puzzling and paradoxical as when they suddenly recognize people in the flesh and talk to them in a coherent manner. 2) Although systematic studies on this topic are desirable but still lacking, it is remarkable that *prima facie*, pronounced near-death visions in people with severe neurodegeneration do not seem to differ phenomenologically from near-death visions of people dying with healthy brains. These aspects of near-death visions should be taken into account in the development of research tools and scales to address the degree of mental alertness and coherence during episodes of lu-

idity. It would moreover seem unwarranted to downgrade the quality of lucid episodes in case patients talk about visions that only they can see, especially since witnesses and patients themselves have stressed that experiencing near-death visions differs from experiencing "ordinary" hallucinations (Brayne et al., 2007; Fenwick et al., 2008). The only large-scale study on near-death visions performed until today has likewise found that these visions do not meet usual criteria for hallucinations but seem to possess autonomous dynamics (Osis & Haraldsson, 1977, 2012).

Furthermore, explicit consideration of particularly remarkable cases of unexpected lucidity could provide empirical evidence for furthering the debate concerning the hard problem of consciousness sketched in the beginning. Extraordinary cases of unusual lucidity could help answer the question of how far the brain's physiology is factually producing phenomenal human consciousness. Take, for example, the case of 19-year-old Juan whose brain activities were examined twice in an fMRI scanner by neuropsychologist Adrian Owen (2017), a renowned expert in the field of developing methods for communication with nonresponsive patients in vegetative states. Here is my summary of it:

In previous examinations, Juan scored 3 of 15 points on the Glasgow Coma Scale, what represents the absolute minimum for coma patients. Indeed, also the fMRI scans performed with Juan during the course of two days showed that the characteristic patterns of activity in brain regions signalling awareness in response to applied stimuli were almost completely absent, although his eyes were open. Consequently, his body was regarded entirely unconscious. Weeks later, however, Juan unexpectedly awoke from his deep coma. To the amazement of Owen, Juan had a full recall of his two visits to Owen's laboratory. He stated he had heard and seen everything, but was not able to move or communicate. Owen confirmed that Juan was able to describe everything that happened correctly and that he also remembered the physicians who had been involved in his examinations. Stressing that



Juan's brain activities had been monitored deep down into its depths and showed no sign of consciousness, Owen was unable to offer an explanation for how Juan could have perceived and memorized all this.

Owen's report ties in with reports from near-death experiencers who report having been conscious and who provided veridical descriptions of what happened to them even after cardiac arrests – i. e., under conditions when standard models of brain function deem conscious awareness and memory storage impossible because of the breakdown of the cortical networks thought to be responsible for enabling these functions (Parnia et al., 2014; Rivas et al., 2016; van Lommel, 2021). A possible relation between paradoxical lucidity and NDEs might also be signified by a report related by Kenneth Ring (2007) according to which a woman in the terminal stage of Alzheimer's disease did not recognize the people who cared for her any more but remembered her NDE to the last. Owen's report about Juan might also lend credibility to seemingly related but almost unbelievable accounts reported from dementia diseases. For example, Jörgen Bruhn (2009) reported a case that was conveyed to him by the head of a nursing home. Here is my summary of it:

An elderly woman in the terminal stage of Alzheimer's disease had mostly lain in her bed staring towards the ceiling. She had not spoken for two years. One day, she suffered a cardiac arrest and was resuscitated. To the amazement of her caregivers and family members, however, she became fully conscious after the resuscitation for a few hours. She thanked everybody for all they did for her during the past years, claiming she had been consciously aware all the time, but had not been able to communicate. She died during the night from a second infarction.

A similar case was reported to me in person. Here, a severely demented woman who had not been able to recognize family members anymore was said to have suddenly regained a lucid state of mind for no apparent reason. She likewise claimed having been

mentally present during the previous time. She explained that her consciousness had detached from her body, and floated above it in a position from where she could observe everything that was going on, but that she had been unable to establish a connection to her body. This woman continued to live in this mentally improved state until she died a few months later. Such cases point to the possibility that there is a lucid and alert mind behind the scenes of non-responsive bodies of patients with late-stage dementia and other neurophysiological brain damage (Nahm, 2012). Should the occurrence of such unusual episodes of lucidity in severely demented people be confirmed in future research, this might also influence discussions about ethical questions in patient care.

However, remarkable reports of paradoxical terminal lucidity are not limited to dementia diseases. Some time ago, we cited a report about a woman who was completely paralyzed after having suffered serious strokes, but who sat up in her bed, and, apparently perceiving a near-death vision, stretched out her arms, smiled, called the name of her deceased husband, laid back, and died (Nahm et al., 2012). Just lately, I was informed about a very similar case: Here, a man had supposedly become entirely paralyzed due to strokes. Even his facial expression was immobile. Yet, after he had stayed in this vegetative state for one month, he suddenly sat up in his bed, looked at his wife and two sons for a few seconds in turn with an alert expression, smiled, laid back, and died. In another recently published case, a non-responsive patient whose brain stem had been destroyed by cancer suddenly opened her eyes so widely that the white was showing completely around her irises, tracked something moving in the room, looked at her two sisters who stayed at her bed, and died (SCRI, 2022).

Should the existence of such paradoxical episodes of lucidity under brain conditions that would usually not allow for their occurrence be confirmed and carefully documented in future research, this might contribute valuable empirical data for advancing our un-

derstanding of the nature of consciousness. As mentioned in the introduction, most philosophical discussions concerning the place of consciousness in nature and the hard problem of consciousness are rather theoretical and chiefly consider “normal” correlations between a healthy mind and a healthy brain. But some of the introduced anomalies, including the case of comatose Juan, question the assumption that the correlations between mind and brain are always strictly symmetrical. Rather, they indicate that consciousness cannot be reduced to a passive by-product of the brain’s biochemistry, notwithstanding that mind and brain activities are closely correlated under normal circumstances.

Conclusion

In this paper, I highlighted seemingly anomalous empirical aspects of the mind-body problem, largely focusing on lucid episodes such as terminal lucidity, paradoxical lucidity, and related occurrences. I am convinced that studying the introduced phenomena with an open mind holds enormous significance for improving the understanding of brain functions and accompanying states of consciousness – both from a practice-oriented and a theoretical perspective. On the practical side, explicitly assessing seeming discrepancies between cerebral structures and mental faculties could provide new insights into the factors that enable memory retrieval, perhaps also in dementia diseases. Potential research questions include the following: How is it possible that some people with severely malformed brains, such as Kim Peek, possess a virtually perfect memory? How can people retain their memories after one of their hemispheres has been disconnected or removed from the rest of their brain, and suffer apparently less impairments than people who lost only a part of one hemisphere? Which neuronal circuits need to be active or intact to enable these feats, and how can their functioning be disturbed or restored? Analogue questions arise with regard to paradoxical (terminal) lucidity. Tackling

such topics could lead to finding new ways of improving memory access in people with anatomical or neurophysiological brain damage.

Moreover, explicit consideration of the interrelatedness of certain episodes of lucidity and EEs could advance the formulation of explanatory models for paradoxical (terminal) lucidity. Studying lucid episodes in an integrative approach with a broad scope that also covers unusual fringe phenomena will allow best for forming a comprehensive understanding of the conditions and circumstances that may trigger unusual lucid episodes and also EEs such as near-death visions. The growing interest in conducting scientific studies on paradoxical lucidity provides excellent opportunities to directly assess spiritual and anomalous aspects of EEs. As a potential research objective, one could address the phenomenology of near-death visions and compare the degree of mental lucidity involved in such episodes to that of terminal lucidity without near-death visions. Another virtually untouched area of research concerns the study of EEs in people with mental disabilities, what might lead to intriguing findings (Nahm & Greyson, 2014). In addition, caregivers have already complained repeatedly about a lack of training concerning how to properly deal with EEs. However, the interest in these topics is growing fast even in the professional medical setting. Evidently, researching terminal lucidity as well as other EEs, plus raising the awareness about them, would result in a better preparation for witnessing and interpreting unusual occurrences during the last phase of life and the dying process. It will therefore greatly benefit the diseased and the dying as well as their kin and caregivers.

Furthermore, assessing cases like that of comatose Juan might throw new light on discussions about organ donation and the question of whether people in vegetative states who show no detectable sign of awareness might still be conscious and even sensitive to pain (cf. Dhanani, Hornby, et al., 2014; Dhanani, Young, et al., 2014; Rady & Verheijde, 2014).

On the theoretical side, empirical studies into anomalous phenomena of consciousness, such as those discussed in this paper, can enhance our understanding of consciousness in manners impossible for studies that merely focus on consciousness under largely normal conditions. This is particularly relevant for the ongoing discussion about the nature of consciousness including human consciousness – one of the most enigmatic questions of mankind. Philosopher Hans Driesch, whose mother's death I described earlier, was very aware of the significance of investigating specifically the unusual facets of consciousness and life. In a book on basic problems of psychology, he therefore demanded:

One must look for exceptions, because exceptions are the best means for avoiding dogmatism. The abnormal is to be investigated; but naturally not because it is abnormal, but because it opens our view for understanding the essence of the normal. (Driesch, 1926, p. 261; author's translation)

Among his guiding principles for studying anomalous phenomena, Driesch considered building bridges to already established areas of knowledge of great importance to contextualize them and find possible explanations (Driesch, 1927; Nahm, 2021). The present paper follows this expedient scientific rationale and I hope it contributed to showing that studying anomalies is one of the most important, interesting, and rewarding undertakings scientists can pursue.

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Die Bedeutung des Außergewöhnlichen im Umgang mit Rätseln des Bewusstseins und ungewöhnlichen Episoden von Geistesklarheit

Michael Nahm

Zusammenfassung: Die Frage, wie biochemische Prozesse im Gehirn zu bewussten Erfahrungen führen, ist noch immer ungelöst. Dieser Beitrag soll die Debatte über dieses Rätsel anregen, indem er für die Untersuchung ungewöhnlicher und anomaler Aspekte des Bewusstseins eintritt. Zu diesem Zweck ist der Inhalt dieses Beitrags in drei Teile gegliedert. Im ersten Teil gebe ich einen kurzen Überblick über ungelöste Rätsel des Geistes. Dazu gehören ungewöhnliche Episoden von Luzidität, die als terminale Luzidität und paradoxe Luzidität bezeichnet werden. Da die Verwendung dieser Begriffe in der neueren Literatur manchmal zu wünschen übrig ließ, erkläre ich im zweiten Teil die grundlegende Bedeutung dieser beiden Konzepte. Der dritte Teil macht Vorschläge für die zukünftige Forschung. Insbesondere plädiere ich dafür, dass solche Studien, die luzide Episoden bei Demenzerkrankungen behandeln, mit solchen Studien über Erfahrungen am Lebensende, wie z. B. Nahtodvisionen, in einen aktiven Austausch treten sollten, um Brücken zwischen diesen Disziplinen zu schlagen. Ein solcher Austausch würde zu einem besseren Verständnis des gesamten Spektrums und damit auch der möglichen Umstände, Ursachen und Hintergründe von luziden Episoden beitragen. Zusammenfassend lässt sich sagen, dass die Erforschung luzider Episoden wie der terminalen Luzidität, der paradoxen Luzidität und verwandter Erscheinungen von enormer Bedeutung für ein besseres Verständnis der Gehirnfunktionen und der damit einhergehenden Bewusstseinszustände ist – sowohl aus einer praxisorientierten Perspektive im Zusammenhang mit

Demenzerkrankungen und dem Umgang mit Erfahrungen am Lebensende als auch aus einer theoretischen Perspektive im Kontext der wissenschaftlichen Debatte über die Natur des Bewusstseins.

Eberhard Bauer

A Importância do Excepcional no Enfrentamento de Enigmas da Consciência e Episódios Inesperados de Lucidez

Michael Nahm

Resumo: O problema sobre como os processos bioquímicos no cérebro dão origem a experiência consciente ainda permanece sem resposta. Este artigo tem como objetivo estimular o debate em torno deste enigma ao defender o estudo de aspectos incomuns e anômalos da consciência. Com este objetivo, o conteúdo deste documento está organizado em três partes. Na primeira, apresento uma breve visão geral sobre enigmas não resolvidos acerca da mente. Estes incluem episódios inesperados de lucidez que foram chamados de lucidez terminal e lucidez paradoxal. Porque o uso destes termos tem sido, por vezes, inadequado na literatura recente, esclareço os significados básicos desses dois conceitos na segunda parte. A terceira parte contém sugestões para pesquisas futuras. Especificamente, sustento que o campo de estudos sobre episódios de lucidez em demências e o campo de estudos sobre experiências de final de vida, tais como visões no leito de morte, devem se engajar em um diálogo ativo, a fim de construir pontes entre as disciplinas. Tal diálogo permitirá uma melhor compreensão do conjunto e, portanto, possíveis circunstâncias, causas e fundamentos dos episódios de lucidez. Em suma, este artigo argumenta que o estudo de episódios lúcidos, como a lucidez terminal, lucidez paradoxal, e ocorrências correlatas têm enorme relevância para aprimorar nossa compreensão acerca das funções cerebrais e estados de consciência a elas associadas – a partir de uma perspectiva orientada para a prática nos contextos das doenças demenciais e para lidar com experiências de final de vida, a partir de uma perspectiva teórica no contexto.

Antônio Lima

La Importancia de lo Excepcional Para Abordar los Enigmas de la Consciencia y los Episodios Inusuales de Lucidez

Michael Nahm

Resumen: El problema de cómo los procesos bioquímicos del cerebro dan lugar a la experiencia consciente sigue sin respuesta. Este artículo pretende estimular el debate en torno a este enigma abogando por el estudio de los aspectos inusuales y anómalos de la consciencia. Para ello, el contenido del trabajo se organiza en tres partes. En la primera, ofrezco una breve visión general sobre los enigmas no resueltos de la mente. Estos incluyen episodios inusuales de lucidez que se han denominado lucidez terminal y lucidez paradójica. Dado que el uso de estos términos ha sido a veces inapropiado en la literatura reciente, aclaro los significados básicos de estos dos conceptos en la segunda parte. La tercera parte contiene sugerencias para futuras investigaciones. En concreto, sostengo que el campo de los estudios sobre los episodios de lucidez en las demencias y el campo de los estudios sobre las experiencias al final de la vida, así como las visiones cercanas a la muerte, deberían entablar un diálogo activo para tender puentes entre sí. Dicho diálogo permitirá una mejor comprensión de todo el espectro y, por tanto, de las posibles circunstancias, causas, y substratos de los episodios de lucidez. En resumen, este artículo sostiene que el estudio de los episodios lúcidos, como la lucidez terminal, la lucidez paradójica, y los sucesos relacionados, tiene una enorme importancia para aumentar nuestra comprensión de las funciones cerebrales y los estados de consciencia que las acompañan, desde una perspectiva orientada a la práctica en los contextos de demencias y el tratamiento de las experiencias al final de la vida, y desde una perspectiva teórica en el contexto del debate científico sobre la naturaleza de la consciencia.

Etzel Cardeña