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The Energy of Despair: Do Near-Death Experiences Have an Evolutionary Value?

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Near-death experiences (NDEs) are usually associated with clinical death, although this association remains controversial. A look back to the early understanding of these experiences, since the end of the 19th century, reveals a different picture than presented in contemporary descriptions. Indeed, the more historical accounts linked NDEs with various forms of intellectual and physical achievements which, in some cases, helped to produce rescue actions for the individual when facing life-threatening situations. This "energy of despair" seems to occur in a subset of NDEs, in which the experiencer becomes suddenly afraid by the prospect of his or her own death. First, we have provided a selective literature review on this topic, ranging from Albert Heim's (1892) personal testimony to contemporary research. We next developed a theoretical psychodynamic approach to understanding NDEs, by which we attempted to integrate their psychological and evolutionary functions. We discuss possible distinctions among "fear-death" experiences, acute dying experiences, and "true" NDEs, and conclude that these experiences may reside on the same continuum. We consider that some, but not all, of these experiences have a common trigger of subjective agony, which can sometimes coincide with a real danger. The phenomenological differences among these experiences may reside in opportunities for rescue actions as perceived by the experiencer.

Keywords: near-death experience, psychological trauma, evolutionary value, hyperalertness, psychodynamic model

Since Moody's (1975) classical description of near-death experiences (NDE), they have been depicted as a syndrome (Larcher, 2005) that encompasses a pattern of perceptions and feelings that includes an out-of-body experience, a sense of moving through a dark space or a fantastic landscape, encountering spiritual beings and an all-loving presence, a panoramic review of life, and intense emotions. By referring to this phenomenology as a "syndrome," we wish to emphasize that these distinct elements combine in complex ways that typically cannot be attributed to or reduced to psychopathology. NDEs are usually associated with clinical death, although this association remains controversial (Augustine, 2007a, 2007b). A look back at the early understanding of these experiences, since the end of the 19th century,

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reveals a different picture than portrayed in more contemporary models (Evrard, Lazrak, Laurent, Toutain, & Le Maléfan, 2018). Indeed, historical accounts have linked NDEs to various forms of intellectual and physical achievements which, in some cases, helped to initiate *rescue actions*[1] for the experiencer in the face of a life-threatening situation (Noyes & Kletti, 1976a). We use the term rescue actions to connote a set of behavioral responses that occur during life-threatening situations, enacted by an organism to ensure evolutionary survival. In the first part of this article, we review the literature on the particular phenomenology of NDEs in response to survival threat, ranging from Albert Heim's (1892) collection of personal experiences of NDEs to more recent surveys and empirical studies. In the second part, we advance a new psychodynamic model by discussing conceptual issues related to NDE research. Our approach is principally psychodynamic because we consider putative unconscious determinants of NDEs connected with their triggering, unfolding, and aftereffects. Therefore, we emphasize a subjective, psychodynamic perspective rather than other perhaps more objective discourses on the NDE episode that focus on scientific evidence for an afterlife or construing NDEs solely as brain illusions. Furthermore, experience-based evidence for the current approach derives from our clinical practice, in which we have adopted a Freudian framework that extends to our work with NDEers, and from which this model is derived.

NDEs and Rescue Actions

NDEs are typically represented, in their most popular form, by someone lying on the ground, passively undergoing a heart attack, whose conscious experience of the world recedes from everyday reality. However, near-death experiences occur under a wide range of conditions and are manifested in different ways. For example, some researchers have described NDEs as an altered state of consciousness during which the individual remains mentally and physically active. This latter description has spurred researchers (e.g., Heim, 1892; Noyes & Kletti, 1976b; Pfister, 1930) to question whether and how NDEs improve the chances of bodily survival and potentially mitigate the traumatic impact of dangerous situations.

Review of Heim, Egger, and Pfister's Contributions

The first collection of NDEs is traditionally attributed to the Swiss geologist, Albert Heim (1849–1937). In his study published in 1892 (and translated into English in 1972; Noyes & Kletti, 1972), he presented cases[1]—including his own—of strange experiences by survivors of mountaineering falls. Heim described feelings of serenity and of acceptance of death, time dilatation, a strong sense of reduced pain, and a series of rapid and abundant autobiographical images which has been called "panoramic life review" or "panoramic memory" (Noyes & Kletti, 1977b).[2] Furthermore, Heim began to record velocity, intensity, and clarity of mental activity in NDEers, as a result of the way they acted with lightning quickness in accordance with the accurate judgment of the situation, which would enable them the greatest chance of survival. He claimed to have gathered 30 examples of remarkable self-lifesaving efforts during surprising falls. In his conclusion, Heim formed the hypothesis that the mental state generated during this experience and the thoughts that accompanied it served to mitigate the impact of a fall by an appropriate appreciation of its consequences.

Heim's study has been discussed by many of his contemporaries (Alvarado, 2011). The French philosopher Victor Egger (1848–1909) was the first to perceive the value of Heim's study for psychology, partially because of Egger's previous research on the apparent duration of dreams and the possibilities for the acceleration of thought (Egger, 1895). Fall survivors' experiences were added to those people who almost drowned, faced other life-threatening ac-

[1] Actually, there is a common mistake in the literature, as Heim did not give the total number of cases he collected from published and unpublished sources. He only wrote that, among all these cases, he gathered 30 examples of situations of imminent danger in which lifesaving acts were undertaken (Heim, 1892; in Noyes & Kletti, 1972, p. 47). These cases represent only a fraction (of unknown size) of his sample and may not all imply NDE (e.g., in one case, somebody who was not in danger saved his falling friend by a quick reaction).

[2] In truth, the qualification of "panoramic review" was already used during the 19th century, for instance by Haddock (1851, p. 213). We thank Michael Nahm for this information.

cidents, or were dying. All of the claimants reportedly witnessed "brain overactivity" and "an incredible intensity of mnemonic forces" (Bergeron & Montano, 1877, p. 341) based on the accounts of several physicians who collected the testimonies of near-drowning victims before the publication of Heim's study (Evrard et al., 2018).

Egger was committed to do the psychological analysis of what he called *expérience de mort imminente* (imminent death experience) to understand why and through which mechanisms the idea of imminent death may cause such "a keen sense of self," as he called it (Egger, 1896), which included not only panoramic memory, but also a sense of bliss, countering anxiety, and out-of-body experiences (Le Maléfan, 2011a). Egger maintained that (a) the NDE phenomenon was real, rare, and not a confabulation or a delusion and therefore of interest to psychologists, but also not "wonderful" and (b) the structure of the experience had elements in common with dreaming (e.g., it consisted consistently of mental pictures), yet was not reducible to it. Nevertheless, the phenomenon could not be a dream in strict terms because the memory of it was marked by hyperlucidity and truthfulness, an aspect he described through the concept of *moi vif* (vivid self; Le Maléfan, 1995). However, Egger did not adhere to Heim's hypothesis that the emergence of this dreamlike scenario, which unambiguously expresses that the ego is going to end, would favor the actual survival of the individual whose life was suddenly threatened (Le Maléfan, 2011b, p. 199). Subsequently, the rejection of this pragmatic hypothesis of the survival advantage of an imminent death experience leads to clinical concerns in terms of the possible psychodynamic function of these scenarios[3] (e.g., to prevent negative aftereffects of psychological trauma). In other words, Egger ended up adhering to a stronger claim in that the NDE helps to demonstrate the psychodynamic features of that particular individual, and therefore, does not merely serve as a psychological adaptation aimed at furthering survival or facilitating the dying process. The NDE, in this way, can then serve as both a clinical heuristic insofar as it illustrates the fantasy structure of the ego upon death, as well as a kind of defensive structure in that the NDE shields the ego from trauma by wrapping the trauma in narrative scene that makes sense for that individual.

The Zürich pastor, Oskar Pfister (1873–1956), one of the pioneers of psychoanalysis in Switzerland, who also had a passion for mountaineering, was an advocate of the adaptive value of these experiences of imminent death. He had experienced two falls, both of which he claimed to have survived thanks to reflexes he associated with a lack of fear and an increase in mental acuity. From the analysis of Heim's self-narrative and his own recollections, Pfister (1930) developed a theory of psychic protection mechanisms during a sudden confrontation with life-threatening danger. In such cases, *Schockphantasien* (i.e., shock fantasies) are established with two functions. The first function is to create a "split" or "disjunction" between "real thoughts" and "autistic thoughts or fantasies." The real thoughts allow action "in the moment" to undertake rescue and potentially life-saving reflex-like actions associated with enhanced mental activity. For Pfister, echoing his personal experiences, this reaction to the perception of imminent death is not a deadly resignation (death drive), but the maintenance of the desire to escape (life drive). The production of an illusion that cuts the individual off from the world (what Pfister called a "hallucinatory autism") would protect from the full impact of threatening external stimuli and generate the notion that there is always a way out, regardless of the reality of the danger, thereby engendering the second function of the *Schockphantasien*: to establish a protective mechanism via comforting and consoling images and memories that buffer against mental trauma and provide subjective support to enact the desire to escape (Le Maléfan, 2011b, p. 200). Facing death, the mind would engage in self-delusion regarding chances of survival, precisely to increase the probability of survival.

Research by Russell Noyes and His Colleagues

Noyes led a series of studies on NDEs before the popular impact of Raymond Moody's work (1975; see Martinovic, 2017). With his col-

[3] To use the term "scenario" to describe the events as experienced and narrated by the subjects prevents premature association with the psychopathological field. This term, though imperfect, seems to be preferable to those of hallucination, fantasy, dreams, etc.

league, clinical psychologist Roy Kletti, he gave new life to the European literature on NDEs by translating it into English, particularly the articles of Heim and Pfister (Noyes & Kletti, 1972; Kletti & Noyes, 1981). Around the same time, they also conducted studies using interviews and questionnaires (Noyes & Kletti, 1976a, 1976b, 1977a, 1977b).

Noyes and Kletti were influential with their suggestion that the NDE may reflect a form of *depersonalization*, by which the endangered subject separates from the body and the threatening events to be dissociated from the unbearable consequences of death and pain.[4] About 60% of their subjects reported that their movements and thoughts were automatisms, and almost 40% felt themselves to be under the control of an external force. Yet this "autopilot" experience was generally associated with a reassuring sense of invulnerability and magical control. They redefined this form of depersonalization as "an adaptive mechanism that combines opposing reaction tendencies, the one serving to intensify alertness and the other to dampen any potentially disorganizing emotion" (Noyes & Kletti, 1977a, p. 381–382). The researchers claimed that depersonalization appeared to be an almost universal reaction to life-threatening danger and a basic adaptive pattern of the nervous system akin to Cannon's fight-or-flight reactions (Noyes & Kletti, 1976b, p. 106). Indeed, Noyes and Kletti's subjects reported extraordinary physical and/or mental efforts to save themselves from life-threatening circumstances (50% of 189 subjects reported in Noyes & Slymen, 1979), which were facilitated or even made possible by changes in their mental functioning.

The analogy between NDEs and the psychiatric symptom of depersonalization attracted critiques, the majority of which denied the value of such an analogy because most NDEs involve positive feelings and a sense of hyperreality, as well as several other aspects that are not typical of depersonalization in psychiatric populations (French, 2005; Gabbard & Twemlow, 1984). For example, Irwin (1993) pointed out that NDEs differ from depersonalization in that what is altered is not one's sense of identity, but the association of personal identity with bodily sensations (i.e., somatoform dissociation; Irwin, 2000). Greyson (2013, p. 340) concluded that NDEers may respond to serious stress with transitory dissociative reactions that are adaptive rather than pathological. Some clinicians even argued that NDEs should be seen as nonpathological experiences that are life-altering in existential ways, and supported the inclusion of NDEs in the Religious or Spiritual Problem category under the Diagnostic Code V62.89 of the *Diagnostic Manual of Statistical and Mental Disorders* (4th ed., rev.; APA, 2000; Evrard & Le Maléfan, 2010; Lukoff, Lu, & Turner, 1998; Turner, Lukoff, Barnhouse, & Lu 1995). In the same move toward depathologizing NDEs, anomalistic and transpersonal psychologists or psychiatrists have typically associated them with positively impactful altered states of consciousness (Greyson, 2013).

These critiques imply that the term depersonalization need not refer to a psychiatric label with pejorative connotations. Indeed, Noyes (with or without his colleague, Kletti) developed a more balanced model holding that depersonalization could refer to an adaptive rather than a psychopathological process. Noyes's phenomenological model identifies two opposing factors, depersonalization and hyperalertness (which he renamed "personalization") that "appear dynamically related one to another" and may be complementary and mutually dependent in finding opportunities for emergency actions (Noyes & Slymen, 1979, p. 319–320). The evolutionary value of such a paradoxical process seems obvious to these researchers, even though it rarely met with a lifesaving action on behalf of the individual (Noyes, 1981, p. 27).

At the current time, we still lack data on the frequency and conditions of the occurrence of such rescue efforts, which appear to have fallen off the radar in the psychological literature. This state of affairs might be a result of methodological changes in the study of NDEs, with a contemporary focus on NDEers with knowable medical conditions in medical settings (such as NDE after a cardiac arrest; van Lommel, van Wees, Meyers, & Elfferich, 2001), an effort to ensure that researchers deal with genuine close brushes with death, and in contrast with earlier collections of spontaneous experiences in more

[4] Recent studies show that the perception of pain (Hänsel, Lenggenhager, von Känel, Curatolo, & Blanke, 2011) and fear of death (Bourdin, Barberia, Oliva, & Slater, 2017) diminish during experimental induction of an "exit-outside-the-body" illusion.

diverse circumstances. Because they thought that depersonalization could be adaptive in certain circumstances, Noyes and Kletti (Noyes & Kletti, 1976a, 1976b, 1977a, 1977b) deployed this term in a way that posited a fruitful connection between the phenomenology of NDE and a reconceptualized understanding of dissociation.

Contemporary Research

Some contemporary mainstream researchers have focused on the phenomenological features of NDEs (e.g., altered perception of time), quite apart from research on NDEs per se, to avoid the epistemological and sociological issues associated with NDE research (e.g., Arstila, 2012; Katz, Saadon-Grosman, & Arzy, 2017). Although we consider it important to build bridges between mainstream and NDE-focused research, it is understandable that some contemporary researchers would avoid studying features of consciousness that are represented in NDEs because of the marginalization of NDE studies, which is partly based on their association with the controversial field of parapsychology (Irwin & Watt, 2007). Indeed, this association deterred serious mainstream study of NDEs at the turn of the 20th century (Evrard et al., 2018). The putative parapsychological aspects of NDEs are still intensively discussed and debated among investigators and the antagonist communities of believers and skeptics (Evrard & Glazier, 2016; Holden, 2009). Accordingly, the persistence of controversy may account for the fact that some contemporary researchers study the features of NDEs in isolation (Martinovic, 2017), apart from the NDE syndrome.

In contrast, Noyes and others attempted to study NDEs by taking the subjective experiences of NDEers in their entirety into account. For instance, Noyes and Kletti (1976a) confirmed Heim's claim that the most frequently reported features in their surveys were an apparent slowing down of external time (75% of the participants), and almost as many subjects reported an increase in speed of thoughts (68%). Arstila (2012) brought together these two strands of experience in an elegant theory of subjective time distortion, which holds "that the experiences of time slowing down are related to the increased speed of internal processes: when we become faster, the world appears slower to us." He further hypothesized, with empirical arguments, that the best candidate for the biological explanation of such a process is the locus coeruleus norepinephrine system, the activity of which increases in frightening accidents. The relevant factors for triggering these experiences of altered time perception appear to be the belief in imminent death and the element of surprise.

Heim (1892), in turn, also referred to both factors, as he noted that people who have encountered these latter experiences (i.e., imminent death, surprise) could subsequently come to be completely psychologically paralyzed in less surprising and/or less dangerous situations. Freud (1920/1996, 1925/1992) also placed a great deal of emphasis on the surprise factor in the occurrence of psychological trauma, which differentiates anxiety/*Angst* (preparation for an undetermined dangerous situation in its absence), fear/*Furcht* (confrontation with a defined dangerous situation), and dread/*Schreck* (unprepared confrontation with a dangerous situation). He dedicated to this latter subjective factor of surprise, which involves the intervention of unconscious mechanisms, a more important role than to the actual intensity of the traumatic event. These unconscious mechanisms involve the degree or resolution of libidinal introjection of a love object as, for example, in his theory of melancholia. The important point, however, is that what Freud meant by surprise in this context helps reveal the psychodynamic (ab)reactions of that particular individual. With regard to NDEs, this affect inaugurates a pathway into the experience of having or approaching one's death.

Stetson, Fiesta, and Eagleman (2007) contended that time only appears to slow down because of unusually rich memories that are the product of retrospective judgments of the duration of a psychologically exceptional event. That is, the strangeness of this kind of psychological event—for example, of an NDE—the fact that the event is out of the norm necessitates a unique level of interpretation that causes a level of processing, thereby causing the experience of time to be slower than usual. To the contrary, Arstila (2012) argued that such fast thoughts are probably not fabricated memories (on the quality of NDE memories, see also Moore & Greyson, 2017; Thonnard et al.,

2013), because they are usually associated with an altered perception of time and support potentially life-saving, purposeful rescue actions. According to this interpretation, the experience of accelerated thoughts reflects a "real" rather than a fabricated phenomenon based on retrospective evaluation.

Arstila (2012) marshalled converging evidence of the complex role that activation of the locus coeruleus (and the noradrenergic neurons that originate from it, releasing dopamine) plays in "mediating shifts in attention and in promoting optimal behavioral performance" (Sara, 2009, p. 220), accelerating internal processes concerning relevant situational features, and thereby facilitating behavioral responses and rescue efforts. Buckley (2014) supported Arstila's analysis and even claimed that "slow time perception can be learned." He added to the evidence his own ethnographic studies of sports players who can actively turn on slow time perception and processing. It is well known that athletes report strange experiences with both hyperalertness and mystical components (Murphy & White, 1995). But some trained individuals or skilled athletes learn, at least to some degree, to stimulate this "specialized hormonal or neurophysiological mechanism for high-speed cognition" (Buckley, 2014) to improve their performance. Buckley suggested that this mechanism only turned on occasionally because of presumable high metabolic costs or side effects that reduce biological fitness if activated continually. This accelerated mental processing includes extremely fine and fast physical adjustments to control body and equipment (e.g., a board or sail) powerfully and precisely in response to equally fast and detailed perceptions of one's own body and the surrounding environment (Buckley, 2012).

At the psychological level, these experiences are well-known as elements of "flow experiences" (Csíkszentmihályi, 1990) and may appear as the induced version of the process we are describing here. Proffering further evidence, Noyes and Kletti (1977a) also provided examples of the same induced effects from psychedelic research. We suggest calling the conscious experience of enhanced cognitive functions the *hyperembodied* consciousness, a neologism that reflects the qualities of fluidity, vivacity, lucidity, and efficiency coordinated by mind and body. Hyperembodiment is generally understood to be a disturbance of embodiment with an excessive fixation on bodily functions (Fuchs, 2005), but here it designates an enhanced conjunction of the felt and real bodies, as opposed to disembodiment (Irwin, 2000), in which the sense of self disconnects from the corporeal body and the body is experienced as an object among other objects. Contemporary research (for a review, see Arstila, 2012) is now attempting to identify psychophysiological mechanisms capable of supporting such emergency achievements or those able to evoke hyperembodied consciousness. NDEs may be a spontaneous process to elicit just such a hyperembodied consciousness, thereby increasing survival opportunities in individuals who find themselves in life-threatening situations.

A Psychodynamic Approach to NDEs

Historically, NDEs have been the subject of several psychological and psychodynamic interpretations, which now compete with neuroscience and medical approaches, but accord psychological and psychodynamic models little explanatory credit (Blanke & Dieguez, 2009; Mobbs & Watt, 2011). To integrate the life-saving rescue efforts associated with certain NDEs to a broader perspective of these experiences, we propose a new psychodynamic approach that reconceptualizes the NDEs as part of a more general process: an adaptive psychosomatic response to the perception of imminent death.

"Fear-Death" Experiences, or the Psychological Trigger of NDEs

On a theoretical level, it is important to determine the triggers of near-death experiences and the mechanisms on which they rely. Most NDE definitions suggest that NDEs are triggered in life-threatening situations, or simply when persons believe themselves to be present in such a situation. The consequences of merely perceiving oneself to be in such a situation have not yet been fully delineated. As such, we place less emphasis on the objectivity of the situation of survival, that is, whether or not the individual's life is actually at risk, and we pay more attention to subjective experiences and psychodynamics. We outline some of the implications to be drawn from merely believing oneself

to be confronted with a life-threating situation, with special attention to potential implications regarding NDEs that have been insufficiently addressed in the literature.

NDEs are not necessarily limited to situations in which life is actually threatened. Accidents in which there was never more than the perception of imminent death have long been known to precipitate NDEs (e.g., Lindley, Bryan, & Conley, 1981, p. 110). Gabbard and Twemlow (1991) concluded that "a decade of continued study has confirmed that the *perception* of being near death, independent from the actual reality of the situation, is the key determinant of the classical NDE." They provided the following example.

> A marine sergeant was instructing a class of young recruits at boot camp. He stood in front of a classroom holding a hand grenade as he explained the mechanism of pulling the pin to detonate the weapon. After commenting on the considerable weight of the grenade, he thought it would be useful for each of the recruits to get a "hands-on" feeling for its actual mass. As the grenade was passed from private to private, one 18-year-old recruit nervously dropped the grenade as it was handed him. Much to his horror, he watched the pin become dislodged as the grenade hit the ground. He knew he only had seconds to act, but he stood frozen, paralyzed with fear. The next thing he knew, he found himself traveling up through the top of his head toward the ceiling as the ground beneath him grew farther and farther away. He effortlessly passed through the ceiling and found himself entering a tunnel with the sound of wind whistling through it. As he approached the end of this lengthy tunnel, he encountered a light that shone with a special brilliance, the likes of which he had never seen before. A figure beckoned to him from the light, and he felt a profound sense of love emanating from the figure. His life flashed before his eyes in what seemed like a split-second. In midst of this transcendent experience, he suddenly realized that the grenade had not exploded. He felt immediately sucked "back into his body". (Gabbard & Twemlow, 1991, p. 42)

Gabbard and Twemlow (1984), among others (for instance, Stevenson, Cook, & McClean-Rice, 1989–1990), sought to distinguish NDEs from fear-death experiences, which differ mainly in that they are precipitated by an experience of dying whose lack of objective precipitants can only be discovered in the aftermath, when the danger is reassessed. What we mean by objective here comprises the empirical factors that would constitute the categorization of a situation as life-threatening, for example, being a soldier in combat or having a cardiac arrest. In contrast, the term fear-death experience captures the subjective factors that can induce an NDE, in spite of the empirical correlates that would make it life-threatening. Hence, the emphasis is placed on reactions such as surprise and its underlying psychodynamics. Accordingly, some NDEs are primarily triggered by the psychological state of subjective agony, therefore are open to psychological and psychodynamic interpretations in line with Egger (1896) and Pfister (1930). Even the neuropsychological theory of NDEs has to combine brain physiology with a psychological analysis to "be able to account for the fact that NDEs can occur in brains that are not dying as well as the fact that not all brains that come close to death experience an NDE" (French, 2009, p. 188). Gabbard and Twemlow (1991, p. 44) asked, "How can it be that children who are years away from a cognitive understanding of the concept of death are capable of elaborating a highly sophisticated psychological defense to deal with it?" They suggested that the concept of death is not required for a NDE, but only a more archaic "sense of *catastrophe*."

Stevenson et al. (1989–1990, p. 53) qualified the term NDE as a misnomer and suggested that "further research lead to its replacement by a term that is less restricting in its implications." The more appropriate term fear-death experience is, however, also very restrictive, as fear does not seem to be the only trigger for an NDE. Furthermore, some NDEs occur in situations in which neither an objective nor a subjective threat is perceived by the individual (Facco & Agrillo, 2012). Moreover, some researchers have argued that, in a few cases, the threat of imminent death occurred too quickly for the NDEer to assess the imminent danger, and thus fearful expectation could not have triggered those particular NDEs (Sabom, 1982, p. 162–163). They concluded that common occurrence of NDEs in these circumstances does not support a necessary preexisting psychological state, such as fear, for the occurrence of an NDE (Long & Holden, 2007, p. 153).

Such arguments are arguably conceptually weak, as researchers in the field still need to determine more precisely the level of perception necessary to become aware of the danger of imminent death. A growing body of evidence suggests that conscious visual awareness of a potential danger is not a prerequisite for human fear, as evidenced, for example, by research on

conditioning fear responses (Lipp, Kempnich, Jee, & Arnold, 2014). As we argued earlier, the element of surprise appears to be a crucial factor in the triggering of NDE, and here we should keep the Freudian distinction between *Angst* and *Schreck* in mind, with the latter perhaps requiring less awareness of imminent threat. In addition, it is difficult to corroborate that some NDEers had no time to realize (or come to believe) that they were dying, because it seems more conceivable that they were aware of it. Although some NDEers claimed that they did not remember experiencing dread before their NDEs, self-reported retrospective accounts are subject to memory distortions. According to a study with experimentally induced syncope (Lempert, Bauer, & Schmidt, 1994a, p. 234; see also, Lempert, Bauer, & Schmidt, 1994b), which may have potential relevance for NDEs, the conscious moments leading up to a loss of consciousness are often forgotten upon recovery. Even if NDE memories appear "more real" than memories of other real or imagined events (Moore & Greyson, 2017; Thonnard et al., 2013), a fraction of the NDEers could not estimate their proximity to death retrospectively (as was the case in 16% of the participants in Moore & Greyson, 2017). Another study showed that volunteers who reported a life-threatening event, but had no accompanying NDE in addition to NDEers were equally likely to produce false memories, but that NDEers recalled them more frequently associated with compelling illusory recollection (Martial, Charland-Verville, Dehon, & Laureys, 2017). Moreover, among individuals who believed they were about to die, paradoxical feelings (calm, peace, acceptance, joy, serenity, and resignation) often immediately counteracted the sense of dread (Noyes & Kletti, 1976a). For instance, Twemlow, Gabbard, and Coyne's (1982) multivariate analysis of conditions that led to NDEs found that almost half of their 33 subjects fell into their "low-stress cluster, . . . characterized by being relaxed and calm, not meditating, not under emotional stress, not on drugs or alcohol, and without any of the characteristics associated with high anxiety or arousal states" (pp. 134–135). They observed that their calm and relaxed responses happened "in spite of physical circumstances that would normally be accompanied by considerable distress" (p. 135) such as childbirth, illness, and accidents. Therefore, a low-stress NDE is not a sign of an absence of response to a dangerous condition, because a characteristic of some NDEs is emotional and cognitive neutralization of the perceived danger, as already discussed by Heim (1892) and Pfister (1930). Further phenomenological and empirical studies are warranted to decipher this precise instant of NDE onset in relation to the perception of a potential threat to life.

Thus, even if researchers generally agree that fear may trigger NDEs, as in the fake grenade case presented above, they disagree on the extent that fear-death experiences and NDEs overlap. Do the data provided by the phenomenological comparison of fear-death experiences and NDEs allow us to decide?

The Boundary Between Fear-Death Experiences and NDEs

The extent to which fear-death experiences are the same as NDEs is still a matter of debate (Augustine, 2015; Sabom, 2008). Such a distinction could become relevant if researchers found evidence for differences between these two experiences, which, to date, has not been the case. Owens, Cook, and Stevenson (1990), for example, compared the medical records of 58 patients in situations in which they were judged to have been so close to death that they would have died without medical intervention (i.e., a "real NDE" group), or they were not in actual danger of dying, although most of these patients thought they were in danger (i.e., an "NDE-like" group). Both groups had had various types of NDE triggers. The researchers concluded that Intensity (i.e., Greyson NDE Scale total score; Greyson, 1983) and Content (i.e., NDE scale features) of reported NDEs did not differ between a real NDE group and an NDE-like group following coma, nor within the real NDE group as a function of the cause of coma (i.e., anoxic, traumatic, or other). The authors also concluded that the presence of many characteristic NDE features in persons who had not been near death supported a psychological interpretation of the experience. That is, NDEs may be triggered by nonmedical circumstances (Zingrone & Alvarado, 2009; see also, Stevenson et al., 1989–1990). Charland-Verville et al. (2014) replicated this finding. They concluded that real NDEs after comas of different etiologies were similar to the NDE-like experiences

occurring after events in which the individuals' life was not genuinely in danger (e.g., sleep, syncope, meditation, drug and alcohol consumption). They agreed that strong belief or fear of dying might be the key determinant for triggering an NDE, independent of actual organic damage. However, their objective definition of "non-traumatic context" as "events such as an exacerbation of on-going illness, complication during surgery" (Charland-Verville et al., 2014) is still problematic. From the subjective perspective, such events may also be labeled traumatic contexts, even if the assessed threat is a false alarm.

Taking a different approach, Sabom (2008) proposed a distinction between fear-death experiences as "acute dying experiences" (ADEs) and "true" NDEs (Sabom, 2008), even though the clinical value of such a distinction is not obvious (Belanti, Jagadheesan, & Perera, 2009, p. 118). The ADE consists of two main components: psychological (or peritraumatic) dissociation and heightened arousal, which includes speeding thought, narrowing and sharpening of perception, and preparation for action. He described ADE as an adaptive strategy in traumatic situations because it would improve the chances of survival as a last resort, analogous to an energy of despair in prey during predator–prey interactions in animals (Sabom, 2008, p. 210). As Sabom observed, the ADE may be followed by a mystical or transcendental experience, which he referred to as the genuine NDE, particularly in persons encountering a more serious threat to life or unconsciousness (Sabom, 2008, p. 183). But he disagreed that it was appropriate to call the entire experience an NDE, reserving this label only for experiences with transcendental or mystical elements. Accordingly, with the same elements that Noyes featured in his three-factor model (Mystical, Depersonalization, and Hyperalertness), Sabom distinguished two experiences: NDE (mystical) and ADE (depersonalization and hyperalertness).

A similar definitional issue crops up in Moody's (1988) book in which he dismissed combat-related NDEs (cNDEs) occurring during war actions on the principle that these experiences, while intense, are not marked by certain transcendent characteristics (e.g., tunnel, kingdom of light; p. 100–101). Moody, however, mentioned Sullivan's (1984) research, which detailed several cNDE testimonies and dozens of phenomenological accounts varying from the feeling of peace to the "complete" NDE experience. Apart from the out-of-body experience, the soldiers described experiences of slow time with two soldiers reporting seeing bullets coming slowly enough to avoid them. The literature about cNDE has remained undeveloped but has recently benefited from a renewed interest. According to Goza (2011) and Goza, Holden, and Kinsey (2014), cNDEs typically have "less depth" (i.e., lower scores on Greyson's 1983 NDE Scale) than NDEs that occur in a variety of other circumstances, but she provided no explanation for this unexpected result.

We suggest that cNDEs and ADEs are not identical to classic NDEs, but that the possibilities of rescue reveal the more proactive side of the same phenomenon. Noyes and Kletti (1976b), p. 108 offered a solution to these semantic issues by identifying three phases of an NDE: (a) resistance, (b) review, and (c) transcendence. They claimed the following.

> As long as any possibility of rescue remains, enormous energy may be directed toward life-saving actions. The phase of resistance ceases when the individual, recognizing the futility of his struggle, gives in to death. This moment of surrender is characteristically accompanied by a feeling of profound tranquility, even joy. (Noyes & Kletti, 1976b, p. 108)

The traditional transcendent features may be less common during the resistance phase, during which hyperalertness (experienced via better vision and hearing, faster and more relevant thoughts and movements, and thoughts perceived as automatic) seems prominent (Noyes & Slymen, 1979, p. 317). In their sample comprised of 91% survivors of accidents, falls, or drowning, 59% reported elements specific to hyperalertness. Only 26% of their subjects reported mystical contents, of which two thirds experienced serious illness (Noyes & Slymen, 1979, p. 316–317). These authors suggested that the mystical state of consciousness represents "a more complete withdrawal from extreme circumstances" (Noyes & Slymen, 1979, p. 318). They suggested the existence of a phenomenological continuum between ADEs and classic NDEs: Some extreme cases present with hyperalertness with few mystical contents (e.g., only the feeling of serenity), and some cases present with mystical contents and apparently

no enhanced cognitive functioning. But most experiences are somewhere along this continuum, as reflected in several surveys (Goza, 2011; Noyes & Kletti, 1976a; van Lommel et al., 2001).

The study of NDEs of hospital patients with serious illnesses and few opportunities for life-saving actions may have shaped a truncated view of NDEs. For example, cardiac arrest survivors may have less opportunity to perceive their life-threatening situation, to plan escape actions, or to recall all this after a coma period, compared with a driver who avoids a near-fatal accident and remains in a vigilant but altered state during that time. Even if, as we are claiming, fear-death experiences are only a subset of NDEs, they still share the same features, although they are distributed differently, insofar as the mystical components associated with, for instance, Moody's theory of NDEs. Such components appear less frequently in fear-death experiences, a phenomenon which, consequently, calls for more scientific exploration. Our hypothesis is that fear-death experience is a more common phenomenon than NDE not accompanied with fear. We suggest that future researchers focus less on contingent medical conditions and more on the psychological factors associated with NDEs, through in-depth psychodynamic interviews and detailed (micro)phenomenological analyses where possible (Petitmengin, 2006).

NDEs as a Heterogeneous Experience

The French philosopher, Henri Bergson (1896/1959), who was familiar with Egger's articles, provided a place for NDEs in his theoretical work (Evrard, 2018; Poulet, Cirino, & Hemminger, 2011). He integrated the panoramic vision experienced by subjects in imminent danger of death into his overall theoretical model and philosophy of mind, which indicated a separation of the mental processes of "pure memory" and "habitude memory," which are usually integrated in the normal or everyday state of consciousness. Bergson (1896/1959) spoke of an "exaltation of spontaneous [pure] memory in most cases where the sensori-motor equilibrium of the nervous system is disturbed" (pp. 171–172). Along these lines, perceiving a life-threatening situation may trigger a disjunction in the mind–body relationship: One part (Bergson's pure memory) is exalted; the other (Bergson's habitude memory) is equally uninhibited and leaves already learned sensory-motor patterns to perform entirely without conscious modulation, as in the case of "psychological automatisms" (Bacopoulos-Viau, 2013).

Although the individuals seem to identify more with the memories deployed by pure memory, their egoistic experiences nevertheless remain split between two different channels. That is, although most people retain a record of panoramic life review and its mystical features, similar to an experience of pure memory in Bergson's model, they also report experiences of hyperembodied consciousness, relative to perceptions of the situation and (automatic) rescue actions. As a result, they remain split between these two flows of subjective experience (disembodied and hyperembodied consciousness). Noyes identified a tipping point in attention as evidence of this dichotomy. At first, individuals would focus on the dangers of the environment and would make efforts to save themselves, but when circumstances overwhelm them or when they abandon rescue efforts, their attention would be redirected to internal experiences, including the flow of memories and the potential experience of "mystical consciousness" (Noyes, 1981, p. 23).

However, it is not completely clear that Noyes's sequence does justice to testimonies that seem to indicate an attention simultaneously stimulated from inside and outside. For instance, one subject reported (Petitmengin, 2006) that, during his very quick near-drowning, he had many pragmatic thoughts regarding how to rescue himself while also experiencing a panoramic review of his life and a flash-forward to the repercussions of his death (Evrard et al., 2018). This attentional state corresponds closely to the experience of splitting (the feeling of being in two places at the same time), as well as feelings of being controlled from the outside (external agency), although the extent to which such experiences occur simultaneously versus sequentially in rapid succession is not clear. The spotlight of attention could slip toward one or the other sense of self without completely withdrawing from either, experiencing a dream-like state and acting more or less automatically.

Clearly, such potential shifts in the focus of attention and awareness are well worth studying. Holden (2009, pp. 185–186) distinguished

between *material* and *transmaterial* aspects of the NDE, and argued that she used the word "aspect" rather than "phase" here "because the latter term implies sequence, whereas NDEers have reported perception of the material world before, during, and after perception of a transmaterial dimension(s)" (Holden, 2009, p. 185). Holden used the technical term transmaterial to refer to the ways in which subjective experience is not bound by the normal laws of physics. The simultaneity intrinsic to the experience (the meaning that Holden wanted to convey with the term aspect) gets at the phenomenological component of temporality inherent in some NDEs, which is a different relationship with time normally not experienced outside of this unique psychological event. As a result, the phenomenology of NDEs should be reexamined in light of the "heterogeneity of the experience" hypothesis, as Pfister (1930) advanced with his psychoanalytic model of *Schockphantasien*, and Noyes and Kletti (1977a) described with their notions of *observing self* and *participating self* during NDEs.

Conclusion

In the current scientific controversy about NDEs, the orthodox perspective assumes that NDEs are artifacts of physiological changes in the brain that occur at moments near death, constitute epiphenomena of a dying brain, and have no intrinsic significance. The other perspective—one held by the majority of near-death survivors and increasing numbers of NDE researchers (Holden, 2009)—contends that NDEs are unique and potentially transformative events that cannot be adequately explained by reductionist models of consciousness. We think these conflicting points of view are best resolved by a *tertium quid* approach (Evrard & Glazier, 2016), which attempts to move beyond these polarized, dichotomous positions. Indeed, some researchers (e.g., Parnia & Young, 2013) acknowledge that physiological events can be spiritually transformative and that spiritual transformation can, in turn, have physiological concomitants.

Through an exploration of the literature on NDEs, we developed a model in which the transcendental aspect of NDEs—which is generally associated with the "Moody syndrome" (cf. Larcher, 2005) and has generated so much public and scientific fascination—would be a part of a more general process having evolutionary value. The aim of such a process would be to sustain life, not be an ephemeral tourism in the afterlife. The evolutionary value of NDE can be seen as a confirmation of James McClenon's ritual healing theory (McClenon, 2002), which is derived from research in the social psychology of anomalous experience, human genetics, and evolutionary psychology, and now has independent support (e.g., Cooper & Thalbourne, 2005; Kelley, 2010). The theory hypothesizes that dissociative abilities and the capacity for anomalous perceptions have a physiological basis rooted in the development of dissociative capacities for coping with trauma among early hominids. Later hominids devised therapeutic rituals that provided greater benefits to individuals with dissociative abilities.

According to ritual healing theory, the survival advantages of NDEs are indirect (i.e., they do not save from a danger, but help to cope with its consequences), whereas in this study, we suggested that direct increases in survival abilities can accrue as a function of altered states of consciousness that some people facing life-threatening situations experience. We can only speculate on the possibility that the human capacity for NDEs may be characterized as a specialized predisposition that could have originated from a "pre-adaptation," permitting early hominids to experience specialized states of consciousness involving complex imagery and ensuring flexible adaptive responses to unpredictable life-threatening situations (see Lake, 2017). More research is needed to confirm that, frequently, NDEers are consciously aware of using this altered state of consciousness to facilitate their survival and to better document the evolutionary efficiency of this resource. It is essential to reproduce Noyes and Slymen's (1979) experiential research and to examine potential indications of time distortion (Wittmann, Neumaier, Evrard, Weibel, & Schmied-Knittel, 2017), perceived and actual rescue efforts, and perceived automatisms in the NDE syndrome.

Another research priority would be to evaluate Noyes and Kletti's (1976b) sequential model through an analysis of the temporal features of NDE narratives (Martial, Cassol, et al., 2017). To test our psychodynamic model, we would also verify that the element of surprise,

which theoretically distinguishes fear from dread (Freud, 1925/1992, 1920/1996), is a necessary condition for the subtype of fear-induced NDEs featured here. The missing element of surprise may explain previous failures to elicit characteristic NDE features in situations such as induced cardiac arrest (Greyson, Holden, & Mounsey, 2006) or when subjects were asked to jump off a building and land in a net (Stetson et al., 2007). But in future studies, it will be necessary to provoke, in controlled and ethically responsible conditions, the sudden impression that the participant is going to die.

If the main trigger for some NDEs proves to be purely subjective, and if their function is to facilitate effective responses to perceived danger, then it begs the question of the validity of the contemporary models applied to these experiences that associate NDE with clinical death. Definitional problems persist in the field of near-death studies (Blanke & Dieguez, 2009). NDEs with many transcendent elements (usually interpreted as core elements indicating the depth of the experience) that people have encountered on stretchers or in hospital beds, for example, may represent a special subset of a more general phenomenon. The understanding of NDEs in accord with Moody (1975) obfuscates the point that, before surrendering to imminent death, the process involves instating physical and mental ways to improve chances of survival (what we call hyperembodied consciousness). Greyson (1993) asked 187 NDEers and 59 non-NDEers if they had "let go and surrendered to the dying process" at the time of their life-threatening event. He found a statistically significant difference in the phenomenology between those who answered in the affirmative and those who answered in the negative: 82% who surrendered reported NDEs, whereas only 60% of those reporting continued resistance reported NDEs, according to his scale.[5] Greyson concluded that, "Surrender to the process of dying and to the possibility of death appears to be strongly associated with the near-death experiences and their affective and transcendental components" (Greyson, 1993, p. 398). Because of phenomenological differences, Noyes (1981, p. 22–23) advised considering separately those NDEs associated with serious illness (and therefore more surrenders) from those that occur accidentally, although the process involved is basically the same. Greyson (1993) also suggested that, "Contrary to the unitary concept of the near-death experience, different circumstances of the close brush with death may foster different kinds of experience" (p. 398). More research is needed to clarify whether all NDEs occur in response to the same physiological or psychological triggers, or if we need as many explanations as there are NDE subtypes.

Our psychodynamic model of an NDE subtype naturally leads us to ask the question of whether the model applies more generally to all NDEs. Although contemporary research focuses on concurrent organic aspects of NDEs (e.g., Mobbs & Watt, 2011), the new model we put forward hypothesizes that all apparent biological causes of NDEs could be contingent and secondary to the fear of imminent death, or more precisely, the complex subjective phenomena associated with such fear or dread and its biological substrate, which merit examination from multiple perspectives. At the time of Egger, the NDE was considered a nonpathological phenomenon in which what was at stake was not the real dying ego, but the true response of the ego to the idea of death (Le Maléfan, 1995). NDEs in which life is not objectively endangered, but is felt subjectively as such, should be more closely studied, because they pertain more to the heart of the phenomenon than cases in which the NDE coincides with an objective threat to life. From a psychodynamic perspective, even without objective correlates, NDEs are not less real, authentic, or worthwhile than NDEs that occur in the presence of objective circumstances.

[5] Lange, Greyson, and Houran's (2004) and (2015) bias tests revealed that Greyson's NDE Scale captured an "NDE core experience" comprised of a probabilistic hierarchy of cognitive, affective, transcendental, and paranormal components that is invariant across experiencers' gender, current age, age at time of NDE, number of years elapsed since the NDE (latency), and intensity of the NDE. This was one of the first empirical, quantitative descriptions of NDE that substantiated insights only assumed previously from spontaneous cases alone.

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