

Near-death Experience and Dream: The Roles of Memories and Self

Li Lin^{1*} and Jiong Xiao²

¹College of Arts and Science Psychology, University of Miami, Coral Gables, Florida 33146, United States

²School of Philosophy, Psychology and Language Sciences, The University of Edinburgh, Edinburgh EH1, United Kingdom

*Corresponding author. Email: linshanova@gmail.com

ABSTRACT

Near-death experiences (NDEs) are complex subjective experiential episodes that occur among individuals who have been close to death, but the concept of “near-death” is not a limiting factor for its definition. Although there is not a definitive story for the genesis of NDEs, three perspectives might provide the potential rationale. This study will place emphasis on three contexts to further investigate the characteristics of NDE and dream. It will juxtapose NDEs against dreaming (another altered state of consciousness that has been studied intensely) and the correlation of self as another probe. A descriptive approach has been used to analyze those factors in-depth. By evaluating similarities and differences between dreams and NDEs based on empirical evidence from past studies, our study aims to look into how NDEs can be described and explained as phenomenal content simulated by the dynamics of the brain.

Keywords: Near-death Experiences, Dream/dreaming, Memory, Consciousness, Self

1. INTRODUCTION

As one of the controversial issues in the field of cognitive neuroscience research, near-death experience plays an influential role in exploring different episodes of consciousness. Notwithstanding there are still many people who do not trust in a near-death experience and consider it as balderdash or an insubstantial product of metaphysics. The number of near-death-experience-related research has progressively increased which further validates the reality of near-death experiences.

Given that the term “near-death experience” was coined in 1975 by Dr. Raymond Moody, and it set up a new prototype for studying neural correlates of consciousness [7]. The definition of near-death experience, yet no one all-embracing exists, is universally accepted that NDE is a collection of discernible mental events with features of self-correlated, immensely sentimental, and mystic respects. NDEs can be induced by any circumstances that weaken cerebral function and generate a particular state between consciousness, dream while sleep, and unconsciousness [2]. However, the usage of the term NDE in both scientific research and popular literature has been extended to a wide range of situations (e.g., religious

experience) as people put increasing focus on the rich phenomena and the altered state of consciousness found in NDE. Moreover, many current studies expand NDE research beyond the classical NDE to NDE-like experiences.

The available NDE-connected research in existence renders an affluent backdrop that creates a boon to probe in greater depth. Nonetheless, current analysis regarding the comparison of NDE and dream remains inadequate. The following paper will juxtapose NDEs alongside dreams, which is another altered state of consciousness that has been discussed profoundly. By evaluating the similarities and differences between dreams and NDEs based on empirical evidence from past studies, this work will sort out advantageous information to merge possible rationales, characteristics, memories, and consciousness to bring them all together. The purpose of this paper is to help improve the description and analysis of NDE and dream connectivity in order to bolster our understanding to avail subsequent research.

2. METHODS

The original experiments on the subject are hard to conduct due to the death of available laboratory contexts, which is a limitation of this study. In practice, the

research will be investigated using qualitative analysis. For the data collection, secondary sources that were collected by prior researchers will be used. This study has applied a descriptive approach to analyze the subject by searching a certain number of peer-reviewed journal articles based on the use of digital databases from the University of Miami Library, PsycINFO, JSTOR, and NCBI websites. The query words are limited to NDE, dream/dreaming, memory, consciousness, neurophenomenology, reality, etc. By reading and analyzing these references, the narrow focus is on the systematic comparison between NDE and dream through the lens/scope of memory and self.

3.FINDINGS/OVERVIEWS

3.1. Derivation/Rationale of Near-death Experience

Taken as a whole, the upward tendency in research towards NDE indicates that numerous experiencers are reporting this unconventional subjective phenomenon. So far there is no universally agreed-upon definition of what a near-death experience is and why it occurs, due to the fact that there are hundreds of thousands of existing findings from varying studies that are making a thorough inquiry into the genesis of NDE. As a probe, three diverse perspectives from philosophy, physics, and neuroscience will be introduced to provide possible justification for the derivation of near-death experience.

At first, in a retrospective exploration, it is pivotal to comprehend the terminology of NDE, which comprises a combination of near-death and experience. It is plausible to say that individuals who encounter life-threatening circumstances will be regarded as in a “near-death” state, yet this is a misleading word when put in NDE. In fact, Kevin Nelson [11] conducted a study that tested the medical records of 58 people who have experienced NDEs. Remarkably, even though the result showed that only 28 individuals confronted imminent death while the other 30 were not clinically jeopardized at that moment, both groups of people displayed similar experiences. In this circumstance, NDE should not be regarded as a unitary entity but a rich collection of subjective phenomena. Therefore, our focus on NDE is not necessarily a closeness to death but a cluster of composite experiences, which might be experienced under a spectrum of circumstances. This investigation provides a new insight that NDE is not limited to near-death situations but exists in a broader spectrum.

Another component “experience” plays a vital role in defining NDE because the experience had to be unambiguous, which is discerned from other fragmental or disordered memories [11]. In order to preferably investigate this distinguishable experience, Greyson [3] came up with a validated quantitative measurement of NDE and its characteristics. As the most recognized scale

of NDE, the Greyson NDE Scale is composed of 16 items about the NDE content, and individuals who obtain a score of seven and above can be assessed as having NDE. This is a good approach to differentiate NDE from other kinds of experiences. Furthermore, other than the Greyson Scale on NDE, Kenneth Ring, a Psychology Professor at the University of Connecticut, developed a five-stage model named the *Weighted Core Experience Index* (WCEI) which contains five essential components of NDE: a feeling of peacefulness occurs at the moment of death, detachment from the tangible body, entering a state of darkness, seeing a splendid light, and engaging in the light to reach another undiscovered domain [14]. These two prominent measurements lay the foundation stones for distinguishing NDE from other experiences.

3.2. Possible Rationale from the Philosophical Point of View

In the seventeen centuries, the renowned French philosopher Descartes proposed Cartesian dualism or substance dualism which stated that the world has two entities/foundations, one material or physical related to the body, and the other spiritual or mental that connected with the mind. The body and mind coexist but develop independently and neither of which influences nor determines the other. In other words, assimilation cannot be applied to the mental and physical. The essence of the spirit lies in thoughts, while the essence of the matter lies in the vastness. By following this perspective, when NDE occurs, the experiencers’ spirits are divorced from reality, or in other words, their physical bodies are switched to a mode of spiritual transcendence. It becomes logical to explain that individuals who are encountering a threat of death even trigger brain dysfunction can still perceive the surroundings and alterations that contain a high level of consistency with reality. This perspective only provides a possible interpretation of how NDE works. In the meantime, monism, which is a more popular theory regarding the mind-body problems in science, proposes otherwise. According to monism, the brain is regarded as the generator of the mind, which implies that NDE is represented by the dynamics of the brain. Such a theory is more in accordance with the scientific disciplines that this work focuses on.

3.3. Potential Derivation from the Perspective of Physics

In 1994, Stuart Hameroff, a Psychology and Anesthesiology Professor at the University of Arizona, and a British mathematical physicist Roger Penrose co-published a book named *Shadows of the Mind* which produced an exhaustive investigation of the human mind and consciousness through the lens of modern physics.

In this book, Hameroff and Penrose (2014) proposed the “Orch OR” theory (Orchestrated Objective

Reduction) which states the quantum computations in microtubules within our brain neurons account for consciousness. Objective reduction (OR) can be explained as a quantum process that is elaborated or orchestrated by microtubules which is a cellular structure that is responsible for organizing intraneuronal activities. They consider that human consciousness is like a well-designed quantum computer inside our brain and exists in microtubules in brain cells; the information stored in our consciousness will fade away after death. Unlike the traditional opinion that consciousness is an inevitable product of neural connections in the brain, they believe that cerebral activity is the consequence of quantum gravitational effects in the microtubules of neuron cells residing in the brain [5].

By providing a bold hypothesis, our soul and consciousness are the universe's fundamental constitution and have existed since the commencement of time. When individuals are clinically declared dead, their physiological reactions will progressively terminate; the heart will stop beating and no longer supply blood; blood will stop flowing, and there will be no more transmission. All bodily activities will be ceased. Although the microtubules of neuron cells will lose their quantum states, the included quantum information will depart from the physical body and might be back to the universe since the product of atoms and subatomic particles should belong there. If the physical body is resuscitated after a short time, the quantum information will re-enter the body after roaming around for a while. Subsequently, the body will re-perceive the surrounding reality with ease, or the connected consciousness will be awakened. This theory can congruously explain the process of how the consciousness goes through during the near-death experience.

3.4. Feasible Explanation from the Perspective of Neuroscience [11]

A cardinal dogma of neuroscience deems that all human conscious experience stems from our brain. As one of the intriguing mystical subjective experiences, NDE is a significant subject geared to the field of neuroscience which fits its framework through the scope of science. In this perspective, NDE might be explained as brain activity. Given that our brain activity leans on aerobic metabolism that is in need of oxygen and glucose to assist our cerebral blood flow, decreased cerebral blood flow typically results in a looming loss of consciousness which gives rise to NDE. Surprisingly, when our brain is in an ischemic or hypoxic state, frequently the boundary between unconsciousness and consciousness is blurred. The consciousness is gone if the cerebral blood flow is below the threshold, and consciousness can display ebb and flow if cerebral blood flow is erratic, which is a routine in hospital contexts.

Out-of-body experience (OBE) is one critical feature

of NDE because most experiencers report they have had it at least once and OBE takes up NDE nearly four-fifths of the time. Besides, OBE can be provoked by straightforward stimulating the temporoparietal cortex with a small electrode. In this case, OBE can be readily manipulated by a neurophysiologist and control the switch. This further furnishes evidence of how NDE originated at a neuroscience level. Another important symptom of NDE is syncope, which produces identical characteristics with NDE, and it is easy to get them mixed up. Most people assume that when individuals have syncope seizures or lapse into a deep coma, their consciousness will embrace a downtime of the body. However, current evidence points out that our brain's electrical activity may stay in a lingering state even during the period of seemingly "unconsciousness".

Furthermore, in the 1960s, Roger Sperry discovered that our two brain hemispheres are independently tasked. This finding was named the split-brain experiment subsequently. It uncovers that our left cerebral hemisphere is responsible for language understanding while the right one is in charge of memory, attention, emotion, etc. In the case of NDE, our left cerebral hemisphere plays a dominant role in the investigation because it is responsible for symbolic comprehension that is related to NDE. Based on this premise, some neuroscience-related considerations offer a possible rationale for some common NDE features: experiencers who enter a dark tunnel may account for retinal ischemia which is common with systemic hypotension; a vigorous association with the visual system can be responsible for seeing a light and this likewise occurs during rapid eye movement when we sleep; the point of life review can be explained as activating our memories when confronting life-threatening situations.

3.5. Near-death Experience Characteristics Under Diverse Cultural/National Contexts

In 1978, an organization called the International Association for Near-Death Studies (IANDS) was established. After two decades, a website named the Near-Death Experience Research Foundation (NDERF) was constituted to probe the studies related to NDE as a societal service. At the present moment, there are more than 3700 NDE experiences across the world posted their personal narratives on this website, which is an indication that NDE is not an exceptional case of a particular setting. Considering that NDE is a widespread phenomenon, three contexts with varying cultural backgrounds--- Western countries, Japan and China will be applied to compare and contrast the NDE characteristics.

Given that the terminology of NDE was originally introduced into English by Raymond Moody, henceforward a great deal of research around this subject has been carried out in Western countries. According to the findings from a multitude of frontier NDE

researchers, they found a series of sequential characteristics when experiencers are in the period of NDE, which comprises of (1) indescribability (2) hearing or spiritually encountering deceased ones (3) peacefulness (4) uncommon sounds (5) being a bystander of looking on oneself's the physical body (6) entering a dark tunnel (7) out-of-body experience (8) meeting incorporeal life entities (9) bright light or "luminous beings" (10) altered temporal perception (11) overall life review (12) experiencing an omniscient realm (13) seeing cities of light (14) encountering a field of mystified souls (15) occurrence of supernatural deliverance (16) a sense of invisible boundary (17) coming back to the physical body and being resuscitated [2]. Even though this research provided an integrated feature of NDE, they can be diversified with other interpretations when put in varied cultural contexts.

In Japanese NDEs, two professors at the University of Virginia offered the relevant investigation. Generally, they found almost all of the observed elements in Western NDEs that presented in Japanese NDEs likewise. Those phenomenological similarities further suggest the authenticity of NDEs. Yet, there are three characteristics of Japanese NDE that have modified explanations. One is about the element of the bright light that more than two pieces of evidence denoting the personification and love features of the bright light are discovered in Western countries accounting for diverse cultural backgrounds. Another one is the image of heaven or the unknown realm. In Western countries, NDEers are more likely to regard this scene as heaven which might be influenced by religious traditions like Christian. In comparison, this can be described as a flower garden in Japanese NDEs. The third one indicates the different views on life review. Although this is one of the common characteristics in Western NDEs, it is not widespread in Japanese ones. The discrepancy may be on account of shifting perspectives. Since in the anticipated/archaic era, the Japanese were more likely to believe in Enma-Daio who is the king of the afterlife (the same as the role of God in Western countries), while people are changing their views and no longer believe in contemporary times [12].

In 1976, there was a severe earthquake in Tangshan, China on July 28th. Two doctors at Anding Psychiatric Hospital interviewed 81 survivors and 40 percent reported NDEs. This is the first official report on NDE in China which plays a significant role in Chinese NDEs. According to this report, 33 percent described a "dark tunnel" experience, 25 percent encountered spirits or deceased kinsfolks, and more than half had an OBE. This report displayed 40 items from both previous literature and their consultation with interviewees. The results of this investigation are highly consistent with the findings of many Western countries on NDEs, which further confirm that NDEs are cross races, languages, and religious beliefs. Some supplementary points are found

in this report. In Chinese NDEs, 58 percent of NDEers experienced personality alteration that a pessimistic person turns out to be an optimistic one, 46 percent reported an altered state of consciousness at the time of the earthquake, etc. One remarkable explanation is about the bright light or luminous body, influenced by the cultural products of the traditional Chinese cultural background. Chinese NDEers are apt to associate it with Yama---God in Chinese edition [16].

To sum up, as in all three contexts mentioned above, NDE can be influenced by prior cultural beliefs. People who have diverse faiths or beliefs may hold various perceptions towards this bright light. For instance, people of the Christian faith may see this as Jesus Christ, the Jewish people may regard this as an angel or God, while people who do not have any religious beliefs may lack such reference to compare and characterize, in which case they would see this as a pure luminous entity.

3.6. Comparative Analysis of Near-death Experience and Dream Regarding Memories

Similarities:

Given that NDE is an atypical subjective experience and discernible when compared with other experiences, like dreams, there are still some shared respects when it comes to NDEs and dreams in connection with memories. First, NDE and dream have similar states of consciousness but with distinct phenomenologies [7]. This could be explained as although both NDE and dream are in a temporarily disconnected state from reality since NDEers and dreamers are concentrating on the episode itself, those two are distinguishable experiences with varied features. Second, considering that our memory is comprised of previous experiences, events, thoughts in unconsciousness, emotions that are influenced by prior culture/religious faiths [7]. The content of both NDE and dream are significantly susceptible to preceding cultural beliefs and personal experiences. Third, from the perspective of age, both NDEers and dreamers of any age are capable of going through those two events, it is surprisingly to remark that even very young children are not only having NDE under some specific conditions but narrating such experiences with the high level of consistency as other NDEers do [6].

Differences:

Despite the common assumption that both states of NDE and dream are to some extent disconnected from the external environment when it comes to memory, the differences existing between NDEs, and dreams are highly remarkable. First, when comparing the nature phenomenology of classical NDEs and dreams, it is obvious that the content and the associated state seem to be distinct. In NDEs, most experiencers report a clear sensorium and an intense sense of reality during such a disconnected state, while dreamers remain an arousable

state at all times [7]. This further indicates a disparity that life-threatening situations are apt to occur in NDE rather than in dreams.

The second difference lies in memory recall. Unlike dreams, of which memories are blurred and susceptible to fading, memories of NDEs tend to be recalled with a high level of detail and resistance to forgetting. Third, NDE experiencers frequently report augmented sensations in near-death experiences, while sensations are unusually blurred in dreams. Fourth, dreaming is typically considered as a state in which contents are completely internally represented, and dreaming is thus seen as disconnected. The uncertainty, however, remains as to whether the contents of NDE are completely independent of external factors. Fifth, NDE occurs in an unstable or abnormal state of the brain while dreaming commonly occurs among individuals with a functioning brain. Sixth, in dreams or other hallucinatory episodes, experiencers are more likely to extract segmental information from recent memory, which leads to familiar people most probably being presented. This is in strong contrast to NDEers that almost all the persons they meet are always to be deceased [6]. Seventh, sensation or emotion can be a varying variable in NDE and dream. Based on the feedback provided by most NDEers, they have experienced a supernormal pleasure or even a feeling of ecstasy which points out a high level of gratification. However, due to various categories of dreams, people may result in having different emotions, such as nightmares can drive people to awful moods.

Furthermore, evidence has been shown that NDE memories are more similar to real memories than imagined memories according to the richness of content and self-referential information. The same study also used EEG to investigate the neural correlates, which further indicates that NDE memories are unlikely to be conjugated as false memories through a reconstructive process [13]. What is suggested by the study is that NDE memories were experienced and stored as episodic memories at the neural level. This leads to a further question—how are memories encoded when the brain is in a seemingly dysfunctional state? The study has also made multiple assumptions based on past theories.

Memories are event-based and typically associated with sensory inputs. Furthermore, memories allow the brain to generate better predictions about the future. A possible answer as to why the dream memories fade away is that the contents of the dream are internally represented and are inconsequential in decision making. In contrast, the clarity of NDE memory and sensory augmentation in NDE might suggest that NDE is more relevant to the physical world of ours, and the state of consciousness in NDE might not be completely disconnected from the physical environment as it is in dreams. In fact, self-reports from experiencers have stated that they were aware of the surroundings when they were going through

NDEs. Although the self-reports are anecdotal, NDE might still act as a probe to explore the possibilities of consciousness.

3.7. The Correlation of Self in NDE and Dream

In the subjects of NDEs and dreams, the self can be another probe to further investigate the correlations between the two aspects of what the work focuses on. Despite the fact that a discrepancy between NDEs and dreams exists, NDEs can be equivalent to lucid dreams to some extent that dreamers preserve self-perception [11]. It is commonly accepted that the experiencers narrate themselves as “I/Me/Mine” to be a specific pronoun that refers to oneself when they are in the period of both NDEs and dreams. The implicit meaning should be they are self-perceivers even though under the circumstances that they might be unable to sense bodily. Indeed, the principle of self is an experiential process that is obedient to continuous variation, a self is generated when we are starting to be aware of our surroundings and the way how we are aware determines this self comes and goes [15]. Our sense of self will have tampered when we are in a somnolent mode as we are about to fall asleep, at that moment, our bodily sensation will show a downward trend. In this soporific state, the boundaries between self and non-self appear to vanish as a mentally isolated individual [15]. Moreover, both NDEs and dreams can bring about a sense of self-immersion because once individuals are in those two experiences, they only focus on where they are, who they communicate with, and what they see until their own physical reactions draw them out to restore the status quo with the purpose of further regain consciousness.

The concept of “self” appears to be a more intricate matter in NDE than in dreams as it is greatly altered. The alterations of self-perception are manifest in two common features of NDE. Ego-dissolution, among the most common characteristics of NDEs, is the sense of the disruption of ego-boundaries. Out-of-body experience (OBE) involving altered senses of self-location, self-identification, and first-person perspective, is the second most frequently reported feature of NDEs. Research has been done on the underlying mechanisms of OBE. The altered sense of self-identification is likely linked to somatosensory and visual signals and involves bimodal visuotactile neurons. First-person perspective and self-location, moreover, depend on the trimodal visuotactile-vestibular neuron, which integrates bodily signals with vestibular cues [1]. What is of great interest to us is the connection between two phenomena. According to a very recent study, a positive correlation is observed between the intensity of ego-dissolution and the intensity of OBE. However, the study was inconclusive regarding their causal relationship [8]. A possibility behind the correlation might be that the altered sense of selfhood, which might result from biological abnormalities, leads

to simultaneous occurrences of two phenomena. Future studies could further explore the possible relationship between the two phenomena.

4. CONCLUSION

By analyzing the characteristics of NDE under diverse backgrounds, it is notable that some features of NDEs are commonly shared regardless of the cultural background possessed by each individual. In terms of memory, despite having several commonalities between NDE and dream, NDE can be more distinct and highly perceptible by those experienced individuals. NDEs outperform dreams regarding self-perception as well. As one of the most contentious topics in the realm of neuroscience, it is worth discussing the selection criteria of effective experiencers/introducers/transmitters of NDEs. First and most importantly, because NDEs can be easily influenced by the prior cultural and religious background of experiencers. The individuals who describe their personal stories and persuade others to believe that they literally have experienced a genuine NDE need to be not only credible and authoritative people (such as experts in the field of science, professors, doctors, etc), but they should not have any religious beliefs, nor should they believe in the afterlife because only atheists refuse the existence of God and heaven. Those who have preceding religious faiths are more likely to result in skepticism from others. The use of atheists as reference objects allows for a more objective and trustworthy account of the experiences. One critique of those NDEers' reports of their perceptions of detachment from the body is that they overly rely on the experiencer's sole statements, which leads to suspicious credibility. Nevertheless, some current cases have been confirmed by independent eyewitnesses which heighten the coefficient of reliability [4].

The improved performance of scientific investigation towards near-death experiences does credit to the advancement of resuscitation techniques [7]. The reflective side of the NDE can illuminate the close thinking and positive stances towards seemingly inexplicable occurrences. Based on the available studies and experimental results on NDE, we are still unable to put a symbol of understanding on NDE with certainty. According to the largest study of NDE in the blind conducted by Dr. Kenneth Ring, nine out of fourteen born blind described in NDEs were highly consistent with the content of typical NDEs in reality [6]. Our finding suggests that NDEs may have a positive connotation, giving people with congenital disabilities a chance to sense the real world. At least in the world of NDEs which are potentially reflected in tangible contexts for only a few minutes or hours, where their physical senses are robust, and they can own the feeling of the maximum pleasure they have never felt before (according to the personal experiences from those proven NDEers).

Another clinical implication was provided by a physician which suggests an effective method is trying to listen instead of saying, in order to convey comfort and comprehension because the most disquieting point for those NDEers would be that no one understands and even questions their sanity [9].

Furthermore, the notion of manipulating laboratory apparatus to artificially create NDEs and apply them to human beings remains to be scrutinized, even though the stimulation of particular brain regions can produce NDE-like features (Martial et al., 2020). If the thought can be accomplished, then it will undoubtedly be a possible new direction for a kind of psychological therapy since the role of mental therapy is to soothe and unwind the patient physically and psychologically to obtain such pleasurable feelings, which is consistent with the feedback from NDE experiencers, and this will further lay the foundation for and strengthen the progression of an overall sense of human well-being. Although the number of NDEers is not significant, it may even be considered a very niche event, its contribution to the research field of neuroscience cannot be underestimated. One of the aftereffects of NDE found a slight transition that those NDEers make their life broadened and deepened [2]. We might be capable of catching a glimpse of the post-mortem world from NDEs and providing people with the enlightenment of warning or pacification from the perspective of death. Because NDEs are often having features like transformational and life-changing, this might derive some profound significance [10]. For instance, after all, everyone has a dread towards mortality. If we can alter this pessimistic attitude from negative to neutral even to no longer fear, in that way it heightens the likelihood of people that they can generate a more positive mindset to confront real-life on a daily basis. More research is needed to corroborate this point.

REFERENCES

- [1] Blanke, O. (2012). Multisensory brain mechanisms of bodily self-consciousness. *Nature Reviews Neuroscience*, 13(8), 556+.
- [2] Craffert, P. F. (2019). Making Sense of Near-Death Experience Research: Circumstance Specific Alterations of Consciousness. *Anthropology of Consciousness*, 30(1), 64–89.
- [3] Greyson, B. (1983). The near-death experience scale. Construction, reliability, and validity. *The Journal of Nervous and Mental Disease*, 171(6), 369–375.
- [4] Greyson, B. (2010). Implications of Near-Death Experiences for a Postmaterialist Psychology. *Psychology of Religion and Spirituality*, 2(1), 37–45.
- [5] Hameroff, S., & Penrose, R. (2014). Consciousness in the universe: A review of the 'Orch OR' theory.

Physics of Life Reviews, 11(1), 39–78.

- [6] Long J. (2014). Near-death experience. Evidence for their reality. *Missouri medicine*, 111(5), 372–380.
- [7] Martial, C., Cassol, H., Laureys, S., & Gosseries, O. (2020). Near-Death Experience as a Probe to Explore (Disconnected) Consciousness. *Trends in Cognitive Sciences*, 24(3), 173–183.
- [8] Martial, C., Fontaine, G., Gosseries, O., Carhart-Harris, R., Timmermann, C., Laureys, S., & Cassol, H. (2021). Losing the Self in Near-Death Experiences: The Experience of Ego-Dissolution. *Brain Sciences*, 11(7), 929.
- [9] Moody, R. A. (2013). Getting comfortable with death & near-death experiences. Near-death experiences: an essay in medicine & philosophy. *Missouri Medicine*, 110(5), 368–371.
- [10] Moore, L. E., & Greyson, B. (2017). Characteristics of memories for near-death experiences. *Consciousness and Cognition*, 51, 116–124.
- [11] Nelson, K. (2015). Near-death experiences--Neuroscience perspectives on near-death experiences. *Missouri Medicine*, 112(2), 92–98.
- [12] Ohkado, M., & Greyson, B. (2014). A Comparative Analysis of Japanese and Western NDEs.
- [13] Palmieri, A., Calvo, V., Kleinbub, J. R., Meconi, F., Marangoni, M., Barilaro, P., ... Sessa, P. (2014). "Reality" of near-death-experience memories: evidence from a psychodynamic and electrophysiological integrated study. *Frontiers in Human Neuroscience*, 8, 429.
- [14] Ring, K. (1980). *Life at Death: A Scientific Investigation of the Near-Death Experience*. New York: Coward, McCann, and Geoghegan.
- [15] Thompson, E. (2016). Précis of "Waking, Dreaming, Being: Self and Consciousness in Neuroscience, Meditation, and Philosophy" *Philosophy East & West*, 66(3), 927–933.
- [16] Zhi-ying, F., & Jian-xun, L. (1992). Near-death experiences among survivors of the 1976 Tangshan earthquake. *Journal of Near-Death Studies*, 11(1), 39–48.