BILINGUAL PUBLISHING GROUP

Forum for Linguistic Studies

https://journals.bilpubgroup.com/index.php/fls

ARTICLE

Can Near Death Narratives, Ontologies and Language Analysis with Natural Language Processing Help Us to Understand the Quantum Mind?

Raul Valverde [1*], ***Konstantin Korotkov*** [2], ***Chet Swanson*** [3]

[1] *Concordia University, Montreal, QC, Canada*

[2] *Bio-Well Corporation, Barcelona, Spain*

[3] *Consciousness Research Foundation, IA, USA*

ABSTRACT

Altered states of consciousness (ASC) encompass phenomena such as near-death experiences (NDEs). NDEs are concise accounts of individuals who have undergone clinical death and subsequently been spontaneously resuscitated or revived, retaining recollection of their experiences during that interval. Numerous individuals who have undergone near-death experiences have recounted experiencing intense mental lucidity, extraordinary sensory images, and a distinct recollection of the event that surpasses the realism of their ordinary existence. The Quantum Hologram Theory of Physics and Consciousness (QHTC) elucidates the fundamental characteristics of our existence and the quantum properties of the human mind. QHTC proposes that the brain functions in a manner akin to a hologram, adhering to quantum principles. The QHTC proposes that during an ASC, cognitive processes accelerate and there is an enhanced level of perceptual lucidity. Natural language processing (NLP) refers to a collection of computer methods used to analyze and represent texts that occur naturally. Ontology is a firmly established theoretical field in the philosophy of language that focuses on conceptual frameworks for understanding reality. This study employs NLP to extract linguistic sequences from NDEs narratives stored in a database including 4267 records. It then utilizes ontology research approaches to establish a mapping between the QHTC ontology and human language. The research aims to verify some ontological components of the QHTC, including the notion that during ASC, cognitive processes accelerate and there is an enhanced level of perceptual lucidity.

*CORRESPONDING AUTHOR:

Raul Valverde, Concordia University, Montreal, QC, Canada; Email: raul.valverde@concordia.ca

ARTICLE INFO

Received: 21 August 2024| Revised: 14 December 2024 | Accepted: 17 December 2024 | Published Online: 14 March 2025
DOI: https://doi.org/10.30564/fls.v7i3.7105

CITATION

Valverde, R., Korotkov, K., Swanson, C., 2025. Can Near Death Narratives, Ontologies and Language Analysis with Natural Language Processing Help Us to Understand the Quantum Mind? Forum for Linguistic Studies. 7(3): 766–778. DOI: https://doi.org/10.30564/fls.v7i3.7105

Keywords: Near Death Experience Narratives; Quantum Ontology; Natural Language Processing; Philosophy of Language; Language Analysis; Quantum Mind

1. Introduction

Altered states of consciousness (ASC) encompass a range of phenomena, one of which is near-death experiences (NDEs)[1]. Near-death experiences (NDEs) encompass concise narratives of individuals who have had clinical death and subsequently been spontaneously resuscitated or revived, while retaining recollection of their encounters during this interval. Numerous individuals who have undergone near-death encounters have conveyed accounts of heightened cognitive lucidity, remarkable sensory visualization, and a distinct recollection of the event that surpasses the authenticity of their routine existence[2].

Quantum theory is widely acknowledged throughout the scientific world as a highly successful and effective theory, regarded as one of the most significant in the annals of scientific history. According to the dominant interpretation of quantum physics, it is commonly acknowledged that the simultaneous measurement of a particle's position and momentum with equal precision is fundamentally unattainable. Moreover, it is hypothesized that a particle exhibits indeterminate qualities when not subjected to interaction with a measuring apparatus. The uncertainty principle posits that a particle is incapable of achieving a state of rest and is perpetually subjected to fluctuations, even in the absence of any measurement. These fluctuations are presumed to lack any discernible causes[3].

There exists a disagreement among proponents of the reductionist perspective, who argue that consciousness can be explained solely as a by-product of brain activity, about the significance of quantum-mechanical elements inside neural networks. Sperry and Henninger[4] as well as Wolf and Hameroff[5] have been observed to overlook the incorporation of quantum physics in their explanations of consciousness. Conversely, Hameroff[6] asserts that consciousness emerges from the phenomenon of quantum coherence within the microtubules present in the neurons of the brain.

Ruyant[7] proposed a theoretical framework that encompasses a quantum ontology of both mind and matter. Within this framework, consciousness is characterized in terms of entanglement, which allows for an understanding of our subjective experiences, the objective reality, and the spectrum of states that exist between awareness and unconsciousness.

In the field of quantum physics, it is possible to represent a collection of particles as a wave, commonly referred to as the "wave function." This wave function can be characterized as a superposition of elementary states. The fundamental principles of quantum theory pertain to the temporal evolution of the wave function. According to Tegmark[8], it is argued that the brain can be regarded as a classical system. This assertion is supported by calculations of decoherence rates pertaining to the firing processes of neurons. These calculations indicate that a neuron cannot exist in a superposed state of both firing and resting. Nevertheless, the proposition that the firing or resting state of each neuron can be objectively and quantifiably determined does not inherently contradict the potential existence of an entangled state within the electric field of the brain, provided that this entanglement remains unobservable beyond a certain level of granularity.

We should not only look at "visible reality" because there is much more to it than that, as quantum physics showed us. Penrose[9] argues that consciousness would be the result of probabilistic quantum effects. There are scientific and philosophical arguments against his theory. Some scientists think that the brain is not a good place for quantum effects to happen. Penrose said that the brain can evaluate functions that can't be computed, and that this ability is linked to awareness. To prove this, someone needs to come up with a theory that fits with what he has been studying for years. The activity of a very large number of neurons spread out across the cortex is linked to the rich and highly differentiated substance of consciousness. It's still not clear how to solve the problem of quantum coherence between single neurons that are millimeters or centimeters apart, how to make sure that quantum information is "not destroyed," and whether awareness is strictly necessary for the wavefunction to collapse.

Goswami[10] says that there are two different ways for the state of a quantum system to change. The first is a steady

change that can be predicted by the Schrodinger equation, which is a part of quantum physics. As the state spreads like a wave, it becomes a coherent superposition of several possible states that are allowed by the situation. The chance amplitude of each possible state gives it a certain statistical weight. A measurement results in a sudden change in the state. Suddenly, the superposition, which is a state with many aspects that appears in potential, is reduced to just one actualized aspect.

Pylkkänen[11] develops a consistent ontological explanation of quantum theory that includes the mind. Quantum theory is said to connect mind and matter. Pylkkänen[11] suggests that micro-tubules may be a site where the quantum field could be changed by mind (when considered as involving a hierarchy of super-quantum fields). Changes in the quantum field in micro-tubules would affect electron behavior, which may be magnified to control large-scale neuronal behavior. Different quantum mind theories provide different reasons why quantum theory may be relevant to mind-brain relationships. Information playing an objective and active role at the quantum level makes quantum mind ideas more plausible.

There is evidence to support the notion that the brain functions as a naturally occurring quantum computer. However, it is important to note that consciousness does not just rely on the brain, since it requires the involvement of a non-local conscious process for its existence[12]. The Quantum Brain Dynamics (QBD) theory, initially proposed by Ricciardi and Umezawa[13], has been further developed to incorporate non-local interactions. According to this theory, the mind can be seen as a combination of three interconnected fundamental states. 1. Nonlocal elemental intelligence refers to the noetic region from which nonlocal conscious processes emerge and demarcates the boundaries of individuality. 2. The cosmological ordering principle, often known as the unified field, is a concept that is of significant interest in academic discourse. 3. The Neurobiological Basis of Quantum Mechanics in the Brain.

1.1. Quantum Hologram Theory of Physics and Consciousness (QHTC)

Roger Penrose[14] attacks those who argue that the artificial intelligence of computers can reproduce human attributes, including consciousness. Penrose, based on the Gödel's theorem and his own subsequent elaborations, concludes that no deterministic system, which is based on rules and deductions, can explain the creative powers of the mind. This nullifies the claim of classical physics, computer, neurobiology, etc., to structure themselves into a complex phenomenon of consciousness. Penrose says that only the peculiar characteristics of non-deterministic quantum physics could issue an approximate judgment on consciousness, within a theory that involved quantum phenomena, macro physical phenomena and conditions of non-locality.

Penrose in his Orch OR Model indicates that probably is in microtubules, microscopic tubes that form the skeleton of cells, including neurons, where the complicated quantum interactions occur that give their "magic" character to consciousness. Hameroff[6], claims to have found evidence that loss of consciousness via anesthesia is due to some inhibition of the flow and movement of electrons within the microtubules. Hameroff[6] argues that certain cellular elements such called microtubules occur quantum-relativistic that "somehow" do emerge consciousness. The major objection to this theory by neuroscientists is that all animals have microtubules in their cells, which seems to imply that they all possess consciousness. Hameroff[6] argues that there is inevitably "some degree of apparent intelligence" in all animal species.

In Valverde[15], an ontological model based on quantum theory proposes that consciousness is non-local and can work independently of the physical brain. Nonlocality or "action at a distance" is the nature of consciousness. Human consciousness is non-spatial and non-temporal and not in the brain but in prespacetime.

According to Mitchell and Staretz[16], the hypothesis can explain anomalous information acquisition, as shown in tests involving remote viewing. Usually, provided information, such earth coordinates, is used to decode the location of a distant target item. The spectator can then recognize a feature of the distant item by resonating with a holographic representation in their mind due to emissions from the object's holographic depiction. Physicist Peter Marcer then improved on Shempp's[17] first mathematical theories on QH by arguing that the brain needs phase-conjugate-adaptive-resonance resonance (PCAR) to see three-dimensional objects as they actually are[17–19]. This idea is depicted in **Figure 1**. According to Mitchell and Staretz[16], the hypothesis can explain

anomalous information acquisition, as shown in tests involving remote viewing. Usually, provided information, such earth coordinates, is used to decode the location of a distant target item. The observer can then recognize a feature of the distant item by resonating with a holographic representation in their mind due to emissions from the object's holographic picture. Physicist Peter Marcer then improved on Shempp's[16] mathematical theories of QH by suggesting that the brain needs phase-conjugate-adaptive-resonance resonance (PCAR) in order to see three-dimensional objects as they actually are[17–19]. This idea is depicted in **Figure 1**.

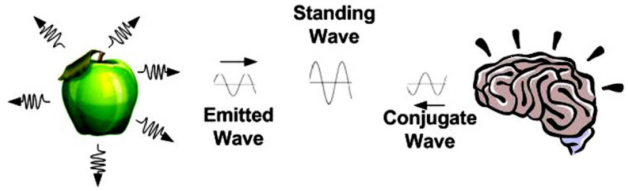

Figure 1. ZPF Information Recovered via PCAR by the Brain[16].

Mitchell and Staretz[16] suggested a new model of natural information processing called Quantum Hologram theory (QH), which explains the origins of consciousness as well as how living entities acquire and use knowledge. It elevates information's underlying essence to the level of matter and energy. Mitchell and Staretz[16] hypothesized that the QH is nature's built-in information storage and retrieval mechanism, which has been used from the beginning of time.

Mitchell and Staretz[16] expanded on Schempp's[17] research by proposing that all cells and organ systems in any biological entity, including the brain, evolved as a massively parallel learning computing system. Mitchell and Staretz[16] argued that quantum emissions from any material entity carry information about the event history of the emitting matter's quantum states on a nonlocal scale. Remember that these quantum emissions are electromagnetic waves with a wide range of wavelengths (or frequencies), and that the information connected with them can be found in both the amplitude and phase relationships of the emitted waves as interference patterns. These interference patterns can convey a large amount of data, including an organism's whole space-time history. According to the QHTC, these processes use a holographic system to store and process information. Holographic circuits in the brain react to information contained inside the holographic representation of a perceived real item. The holographic image stored non-locally in the zero-point field is referred to as a Quantum Hologram. An entity recognizes an external item when its non-local emissions resonance with an internal holographic image in its consciousness. External holographic projections accurately depict the thing in three dimensions. The method is like how a bat or dolphin recognizes an object after hearing the echoes of its sonar transmissions. The classification and recognition of patterns in a sonant loop is described as "the foundation for all living organisms' most fundamental level of perception." The holographic information contained in the zero-point field can resonate with any brain that has been programmed to do so through quantum entanglement.

Mitchell[20] asserted that perception and intentionality are the most fundamental characteristics of consciousness. Mitchell[20] establishes a link between creation and intentionality, which he sees as an important part of consciousness. The data suggests that each physical item (alive or nonliving) has its own distinct resonant holographic memory that is non-locally stored in the Zero Point Field[19].

Hernandez et al.[21] contend that the QHTC elucidates the character of our reality and non-ordinary states of consciousness. The analysis of ASC phenomena, such as NDEs, out-of-body experiences (OBEs), and contact with Non-Human Intelligence (NHBI), is one of the keys to comprehending "consciousness," according to Hernandez et al.[21].

Hernandez et al.[21] postulate that consciousness is a phenomenon that connects all of these occurrences. They also suggest that advanced physics, particularly the QHTC, can begin to provide a basic understanding of the connections between the diverse altered states of consciousness experiences[20]. Several fundamental principles of quantum theory are correlated with the quantum-like holographic qualities that certain aspects of this phenomenon exhibit. Among these are: 1) Experiments that demonstrate quantum entanglement-related phenomena that are unaffected by distance, such as "telepathy" (outside space)[22] and "precognition" (outside time) that can provide information about future events[23]; and 2) Nonlocality, coherence, and instantaneous information exchange in a timeless and placeless dimension.

The QHTC also postulates the concept of a universal memory that postulates that at the subatomic scale of matter all objects in the universe retain evidence of each event that has occurred to them that is stored in a holographic form that can be retrieved by the mind when it "attends" to an object

Mitchell[20]. The QHTC, which proposes that consciousness is non-local, originated and is supported by Schrödinger who hypothesized that the quantum mechanical wave function serves as a field of consciousness, and that Extra Sensory Perception (ESP) could be explained by realizing that the quantum wave function extends over the entire planet and that our minds are immersed in it[24].

The QHTC provides an explanation for the quantum nature of the mind as well as the nature of our reality. Following the laws of quantum mechanics, the QHTC hypothesis proposes that the brain functions in a manner that is analogous to that of a hologram[1]. The QHTC hypothesizes that while people are in ASC, their thoughts speed up and they experienced a greater degree of vivid mental clarity. Natural language processing (NLP) is a collection of computer approaches that are used to analyze and represent naturally occurring texts at one or more linguistic levels. NLP is part of artificial intelligence that has been used recently to analyze large amounts of data[25]. The goal of NLP is to achieve human-like language processing for a variety of activities or applications[26]. The narratives of NDEs that are contained in a database with 4267 records are analyzed by this research using NLP, and ontology research approaches are utilized in order to map QHTC ontology to human language. The research is being conducted with the intention of validating some ontological features of the QHTC. In particular, the idea that when one is in an altered state of consciousness, one's thoughts speed up and there is a high level of awareness of the mind is the focus of the research.

1.2. Quantum Ontology

The quantum ontology has been proposed to represent not only objective but subjective worlds[7]. According to Ruvant[7], a quantum ontology can be used to represent consciousness, which accounts for the existence of a continuum between conscious and unconscious states. Quantum ontology has been used in psychology and consciousness.

Adherence to quantum principles yields a dynamic theory of the mind/brain/body system that is in close accord with our intuitive idea of what we are[27]. Bohm's theory that quantum events are partly determined by subtler forces operating at deeper levels of reality ties in with John Eccles' theory that our minds exist outside the material world and interact with our brains at the quantum level[3].

Quantum ontology has been employed in the examination of consciousness within the realm of psychology. Valadas Ponte & Schäfer[28] outline the parallels between the fundamental principles of quantum physics and Carl Gustav Jung's psychology. They contend that the observable universe is a manifestation of a celestial domain of possibility, from which physical structures can emerge in the exterior world and archetypal thoughts can arise in our minds. Quantum ontology has already been employed in study on near-death experiences. In his work, Tyler[29] examines NDE language narrative stories through the lens of Quantum ontology.

According to Beck & Colli[30], advances in quantum physics, biomechanics, holographic information theory, and consciousness studies support for the first time a fully realizable quantum biomechanical basis for near-death life reviews. Beck & Colli[30] explains that the zero-point field lends credibility to vast memory storage capabilities outside the physical body. Microtubules are key components in non-local, quantum processes critical to human consciousness. According to current memory research, it is implausible that one's life, replete with minute details, can be remembered in its entirety, let alone reviewed in a matter of seconds. Such life reviews become even less credible if they include perceptions of those same events as experienced through the senses of others. Yet vividly empathic life reviews are commonly reported during near-death experiences. Moreover, such experiences are often subjectively described as occurring "outside of time and space," which is consistent with the concept of instantaneous communication proposed by the Quantum Ontology Model[30].

Charland-Verville et al.[31] performed a user-independent statistical text examination of freely expressed NDEs narratives. This study is of particular importance in capturing the phenomenology of such a subjective and complex phenomenon. The study included 158 participants with a first-hand retrospective narrative of their self-reported NDE that was analysed using an automated text-mining method. The output revealed the top words expressed by participants in **Figure 2**.

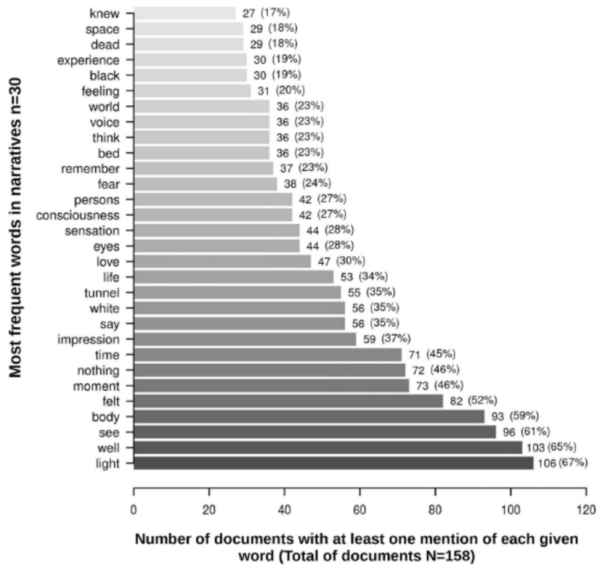

Figure 2. The most frequent words in NDEs Taken from Charland-Verville et al.[31].

During this introduction, the quantum paradigm was examined and justified for the NDE analysis given the history of to represent the life review of the NDE experiences, therefore this ontology has great potential for this type of analysis. As most NDE experiences are narratives captured in databases, this research proposes a data mining with NLP approach that can help to validate quantum ontological constructs of speed of mind and highest levels of awareness that are proposed by the non-locality aspect of the QTHC.

The utilization of quantum consciousness paradigms in this research can elucidate the phenomenon of consciousness[15] and offer the necessary incomprehensible element to articulate NDEs and integrate them into a cohesive framework of quantum consciousness.

1.3. Skeptical Views of the QHTC

The skeptical views are the ones whose followers hold that science can never interpret and understand consciousness. In general, this would be so because the secret of "being aware" is not based on a simple phenomenological problem, but on the contrary, the great challenge is to explain that part of "the consciousness that is aware of own consciousness". In other words, the great mystery is that we are aware of we have consciousness, and that is irreducible to science.

Dr. Flanagan[32] says all tests so far carried out empirically (i.e., based on actual experiences under certain control), test nothing concrete since in all cases it was people especially trained to do this or that exercise, which was to be measured. Such training distorts the conscious content of the individual, so nothing can be said about consciousness in such a case. In fact, the Dr. Flanagan argues that it is possible to talk about different types of consciousness, already even neuroscientists have so far been able to confirm that the neuronal system that perceive aromas is different from that responsible for visual perception. Flanagan is an advocate of a broader theory, which he calls "Constructive naturalism "', according to which consciousness would not only be in the man, but also in other animal species and especially primates.

Dennett of Tufts University supports Dr. Flanagan's line, in his book entitled "Consciousness Explained"[33], Dennet[33] proposes, according to the latter, that if something can glimpse regarding consciousness is a triple system that integrates the neural data, psychological and those deduced from human subjective experience. This scheme would accommodate some species of higher-level animals and not only humans.

Colin McGinn, professor of Rutgers University, in his book "The Problem of Consciousness", makes clear his argument that we are not equipped to understand the workings of consciousness[34]. Thus, in the same way that any animal species cannot even guess the meaning of a football game, maybe the human species will be off limits of certain areas of their existence, including the mind-matter relationship.

Neuroscientists initially despised these ideas, then try to ridicule, and finally, in the last years, discussed it to the undeniable intellectual stature of many of his followers. Neuroscientist's view of consciousness is completely different from the one proposed by the QHTC.

Koch & Crick[35] believe in a more neuroscientific approach to consciousness and proposed some further ideas regarding the neuronal basis of consciousness. Neuroscientists in principle are not satisfied with anything that smacks -of subject-subjectivity like the QTHC that bases the creation of reality on the observer.

2. Materials and Methods

A database was established utilizing the study conducted by Dr. Jeffrey Long through the Near-death Experience study Foundation (NDERF) as documented on their official website (https://www.nderf.org/). Dr. Jeffrey Long,

an American author and researcher, specializes in studying NDEs. Long, who is trained as a physician, specializes in radiation oncology at a hospital located in Louisiana. Long authored the book "Evidence of the Afterlife" in collaboration with Perry in 2010[36]. He established the Near Death Experience Research Foundation, dedicated to documenting and doing research on NDEs.

The database has a total of 4267 entries documenting near-death language narratives (NDEs), which have been systematically collected for the aim of academic investigation[36]. The NDERF foundation collects data from the public through its website, participants that participated in the study signed an informed consent form, where a written explanation of the research protocol was provided. Participants then are asked to complete an online questionnaire based on their NDE experiences. Data was cleansed by preprocessing the data collection by removing records that were incomplete or fields that were not completed.

The study utilizes a multi-step approach, as depicted in **Figure 3**, following the framework proposed by Culmone et al.[37]. This methodology involves gathering data from a MySQL database and subsequently associating it with probable quantum ontology components. The process of mapping will be executed through the utilization of SQL (Structure Query Language) statements, which will retrieve data that aligns with the semantic representation of the ontological construct being analyzed[38]. The validation of data accuracy in representing the ontological concept under inquiry was performed by using human recognition[39, 40]. This means that the researchers examined visually and by using human cognition the data accuracy for ontology construction.

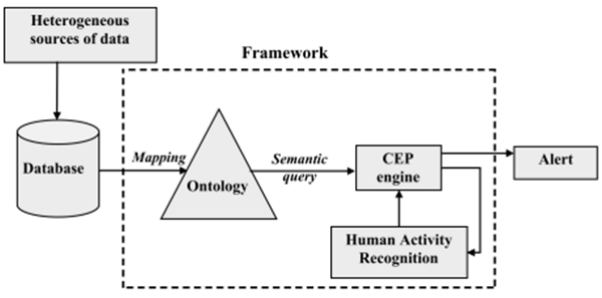

Figure 3. Taken from Siddiqi and Sharan[41].

Rodriguez et al.[42] proposed 5 cases of database and ontology mapping as follows (refere to **Figure 4**):

- Direct Mapping. A DB table directly maps a concept in the ontology. Every record of the table will correspond to an instance of an ontology concept. Join/Union. A set of DB tables map a concept in the ontology when they are joined. Every joint record of the joined tables corresponds to an instance of an ontology concept.
- Projection. When a subset of the columns of a DB table is needed to map a concept in the ontology. Selection. A subset of the rows of a DB table maps a concept in the ontology. Any combination of these cases is also possible.

Natural Language Processing (NLP) is a theoretically motivated range of computational techniques for analyzing and representing naturally occurring texts at one or more levels of linguistic analysis for the purpose of achieving human-like language processing for a range of tasks or applications. This technique was used for the analysis of NDEs for the identification of ontological constructs that can be used to validate the QTHC consciousness constructs[43].

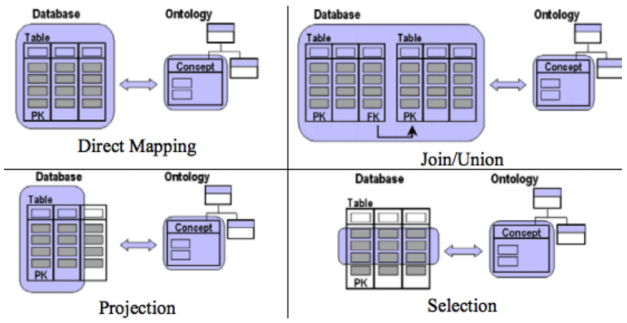

Figure 4. Taken from Rodriguez et al.[42].

In order to examine the extensive collection of records, a natural language processing (NLP) methodology was employed, drawing inspiration from the research conducted by Siddiqi and Sharan[41]. Natural Language Processing (NLP) has demonstrated its efficacy in addressing a diverse range of challenges, such as language translation and text analysis[44, 45]. The objective of this analysis is to establish a correlation between words and ontology structures through the utilization of N-gram word frequency analysis. Frequency analysis is a statistical technique employed to ascertain the frequency at which a specific word or set of terms occurs within a given text. The utilization of text analysis in the study of NDEs has been previously explored. Martial et al.[26] conducted a user-independent statistical analysis of spontaneously shared narratives of NDEs in order to get insights into the intricate and subjective nature of this phe-

nomena.

Nef et al.[46] developed the method in **Figure 3** for finding the ideal metric of the performance of the ontological model. For the classification process, this research used questions that were linked to the unity ontological construct. Three questions were prepared to identify the main characteristics of the ontological construct.

The degree of association between words and conceptions can be quantified using the F-measure and Accuracy. According to the study conducted by Van Kasteren et al.[47], These metrics aid in determining the degree of correlation between an ontological construct and the facts under analysis (refer to **Figure 5**).

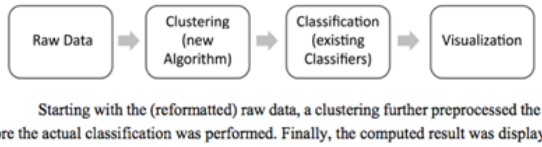

Figure 5. Taken from Nef et al.[46].

The F-Measure has gained significant popularity as an evaluation tool for classification problems[48]. Precision is a metric that quantifies the accuracy of a classification system by measuring the proportion of correctly identified positive examples, known as true positives (TP), relative to the number of examples incorrectly labelled as positive, referred to as false positive results (FP). The TP number serves as a metric for assessing the categorization capacity of queries. A higher TP value is indicative of superior performance.

The precision is the ratio tp/(tp + fp) where tp is the number of true positives and fp the number of false positives. The precision is the intuitive ability of the classifier not to label as positive a sample that is negative. The recall is the ratio tp/(tp + fn) where tp is the number of true positives and fn the number of false negatives. The recall is intuitively the ability of the classifier to find all positive samples.

The F-measure score can be interpreted as a weighted harmonic mean of the precision and recall, where an F-beta score reaches its best value at 1 and worst score at 0.

The research also uses the accuracy metrics proposed by Salguero et al.[49] to measure the performance of the classifier.

In the context of classification, it is generally anticipated that a coin toss or random sample would yield a probability of 50%. However, if the F-Measure surpasses the threshold of 0.5, it signifies a superior classification performance compared to random chance. Classification errors occur when a model incorrectly identifies an instance as belonging to a certain class, despite it belonging to a different class. The F-Measure metric is utilized to assess the effectiveness of retrieving positive instances in a classification problem. However, it fails to account for the accurate categorization of negative examples, as shown by Salguero et al.[49]. The present study employed the F-Measure, which is calculated using the following formula:

(i) $F\text{-Measure} = 2 \times ((TN \times TP))/((TN + TP))$

Accuracy is a performance metric, consisting of the ratio of correctly predicted observations to total observations.

(ii) $Accuracy = ((TN + TP))/((TN + TP + FP + FN))$

Das et al.[50] introduced a set of SQL operators that can perform ontology-based semantic matching and the implementation of ontology related functionality on Oracle RDBMS. They also use some examples to illustrate the use of these matching operations. For example, they apply it to date from Homeland Security to detect terrorism. Their proposed ontology suggests a construct that represent terrorists that perform a set of actions that are part of the characteristics of being terrorist. The instance they give is to query out two people who live together. One rents a truck and another one buys fertilizer. The query and the table are in **Figure 6**. The result shows the suspicious activities involving a combination of different actions.

Person_name	Address	Activity	Object
John Buck	Addr1	Rent	Ford F-150
Jane Doe	Addr1	Buy	Ammonium Nitrate
…	…	…	…

```
SELECT *
FROM ACTIVITY x, ACTIVITY y
WHERE
 x.Activity = 'Rent' AND
 y.Activity = 'Buy' AND
 ONT_RELATED(x.object,'IS_A','Truck',
             'vehicle_ontology') = 1 AND
 ONT_RELATED(y.object,'IS_A','Fertilizer',
             'chemical_ontology')=1 AND
 x.Address = y.Address;
```

Figure 6. Taken from Das et al.[50].

The hypotheses are postulated below:

H0. *F-measure ≤ 0.55 null hypotheses states that the proposed ontological features that cognitive processes accelerate and*

there is a high level of awareness of are not accurate.

H1. *F-measure > 0.55 alternative hypotheses states that proposed ontological features that cognitive processes accelerate and there is a high level of awareness are accurate indicating that can represent these features above random chance.*

In this study a one-sample one-tailed z-test will be performed to compare population mean (of ontological metrics) with the predefined value of 0.55 using one sample of data. The z value will indicate the amount of evidence against the null hypothesis, H0, or in support of H1. The p value will evaluate the probability that null is true, the probability of observing a sample like the one we are evaluating if null was true. A 99% significance level is selected for the study.

3. Results

The research validates the ontological construct that proposes that in ASC, thoughts speed up and there is a high level of awareness of the mind [1]. The following questions were asked to people that experienced NDEs.

- Question 1: What was your level of consciousness and alertness?
- Question 2: Did you experience a higher-level consciousness?
- Question 3: Did you notice a difference in your level of consciousness and alertness during your experience?
- Question 4: Explain the sense of understand everything during your experience

The first step was to list a set of keywords that relate to the thoughts speed up and there is a high level of awareness of the mind than usual to construct an SQL statement that could help calculate different metrics to understand if this construct is supported by the answers to this question. The list of keywords and the frequency of their occurrence after a computer language processing analysis of the 4079 answers is depicted in **Figure 7**.

To begin, a set of keywords related to the acceleration of thought and higher level of awareness of the mind were listed. The objective was to formulate a SQL statement that may facilitate the calculation of various metrics to determine if this concept is supported by the responses to the given question. **Figure 7** displays the list of terms and their respective frequencies, obtained from a computer language processing analysis of the 4079 replies.

The initial procedure involved compiling a collection of keywords pertaining to thoughts speed up and there is a high level of awareness of the mind, with the objective of formulating a SQL statement capable of computing various metrics. The purpose of this endeavor is to ascertain whether the construct is substantiated by the responses to the query at hand. **Figure 7** illustrates the frequency of occurrence of terms obtained by a computer language processing study of the 4079 responses.

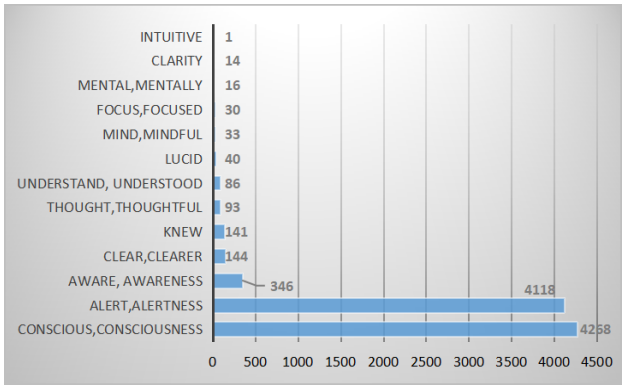

Figure 7. Frequency analysis results.

An SQL query was developed using the keywords shown in **Figure 1** to obtain all the answers that contain these keywords. Various metrics were computed to assess whether the replies corroborate the ontological notion that in ASC, cognitive processes accelerate and there is a heightened level of self-awareness. These metrics are presented in **Table 1**.

Table 1. Metrics for the SQL statements.

Accuracy	F-Measure
62.53%	0.66

The results of the hypothesis testing below in **Table 2**. Since < 0.0001% is less than the significance level of 1.00%, we have sufficient evidence to reject the null hypothesis and accept the alternative hypothesis. This hypotheses states that proposed ontological features of thoughts speed and high level of awareness of the QTHC are accurate indicating that can represent these features above random chance.

Table 2. Hypothesis testing results.

	Significance Level	Sample Proportion
z-score	2.33	14.12
Probability	1.00%	<0.0001%

4. Discussion

The article discusses a study conducted to verify certain ontological components of the QHTC, including the notion that during altered states of consciousness, thoughts accelerate and there is an elevated level of mindfulness.

The QHTC elucidates the fundamental essence of our existence and the inherent quantum properties of the human mind. QHTC posits that in ASC, cognitive processes accelerate and there is an enhanced level of lucidity in mental experiences.

Ontology is a firmly established theoretical field in philosophy that focuses on conceptual frameworks for understanding reality. The ontologies examined in this study are the acceleration of thoughts and the heightened amount of mind awareness in individuals with ASC.

The research findings indicate that there is a positive correlation between thoughts speeding up and a heightened level of mind awareness. This is supported by the metrics presented, and the hypothesis supporting the alternative hypothesis this confirms the notion of the QHTC regarding the non-local nature of the mind.

Penrose and Hameroff' [6, 51] hypothesize that quantum activity within the neuron interacts non-locally with other neurons, enabling a "conscious event" when combined with the quantum hologram. Their theory has been used to explain altered states of consciousness such as NDEs. The results of this research back up the hypothesis of the Penrose and Hameroff's Orch OR model.

The results also support the idea of quantum intelligence in Penrose's Space-Time Geometry. Valverde et al. [52] highlights that the problem with this model is that brain matters play an essential role in creating personality and consciousness while near-death studies show that there is immaterial intelligence that moves freely in the environment and interacts with the intelligence enclosed in the brain.

The research demonstrates the potential of ASC in enhancing mental performance and supports the QHTC consciousness paradigm, which proposes the non-locality of the mind [1]. Previous studies have already established the positive effects of inducing ASC on mental conditions like stress, anxiety, and depression, with the explanation rooted in the concept of the non-locality of the mind [53, 54]. One plausible explanation is that ASC mitigates the cognitive distortion caused by the brain, hence enhancing mental performance. This aligns with the synergistic theory proposed by Grinberg-Zylberbaum [55].

5. Conclusions

The research results support the potential of ASCs in the improvement of mental performance and the validity of the QHTC consciousness paradigm that hypothesis the non-locality of the mind, the induction of ASC has already been proven to show positive results for mental conditions such as stress, anxiety and depression [53]. ASCs seem to remove the distortion that is created by the brain and therefore improve the mental performance, this supports the syntergic theory of Grinberg-Zylberbaum [55].

The approach proposed in this paper opens new avenues for serious rational inquiry into mysteries of consciousness. The proposed research development can give people useful new means of describing profound transcendent states of consciousness. The research also validates the usefulness of the QHTC to model unintelligible aspects of consciousness such as non-locality and entanglement. The positive results of this research also suggest the applicability of this method to other properties of the QHTC model such as entanglement.

However, there are several limitations of the study, biases in participant responses would an important limitation. Further investigation could be conducted to examine the potential application of the synergistic theory in elucidating the phenomenon of consciousness. Based on the theoretical framework, it is posited that the human brain possesses the capacity to generate a very intricate network of interactions, which arises from the activation of all its constituent neuronal components. The term "neuronal field" is utilized to designate this matrix of interactions. The activation of neural activity leads to the unification of its effects. It is postulated that the neural field may induce a perturbation in the underlying space-time framework, leading to the impression of a distorted reality. The theory posits that the interaction matrix serves as a unifying force. It suggests that upon the

demise of the human body, the neurosyntergic energy of human consciousness intensifies, ultimately leading to a state of unity. This phenomenon may account for the perceived acceleration of thoughts and heightened awareness of the mind, as discussed in this paper. The hypothesis put forth in this study proposes that the brain distorts reality, but the integration with the neuronal field eliminates such distortions and enhances cognitive functioning[55]. Future research has the potential to integrate this theory in order to elucidate the manner in which ontological constructions serve as representations of conscious elements that are observed and subsequently shape our perceived reality.

Author Contributions

Conceptualization, R.V.; methodology, R.V.; software, R.V.; validation, K.K.; formal analysis, K.K.; investigation, K.K.; resources, R.V.; data curation, K.K.; writing—original draft preparation, R.V.; writing—review and editing, K.K.; visualization, R.V.; supervision, C.S. and R.V.; project administration, R.V. All authors have read and agreed to the published version of the manuscript.

Funding

This work received no external funding.

Data Availability Statement

Not applicable.

Conflict of Interest

The authors declare no conflict of interest.

References

[1] Valverde, R., Korotkov, K., Swanson, C., 2022. The Quantum Hologram Theory of Consciousness as a Framework for Altered States of Consciousness Research. NeuroQuantology, 20(3), 187–197.
[2] Greyson, B., 2010. Implications of Near-Death Experiences for a Postmaterialist Psychology. Psychology of Religion and Spirituality, 2(1), 37.
[3] Pratt, D., 2007. Consciousness, Causality, and Quantum Physics. NeuroQuantology, 1, 58–67.
[4] Sperry, R.W., Henninger, P., 1994. Consciousness and the Cognitive Revolution: A True Worldview Paradigm Shift. Anthropology of Consciousness, 5(3), 3–7.
[5] Woolf, N.J., Hameroff, S.R., 2001. A Quantum Approach to Visual Consciousness. Trends in Cognitive Sciences, 5(11), 472–478.
[6] Hameroff, S.R., 1994. Quantum Coherence in Microtubules: A Neural Basis for Emergent Consciousness. Journal of Consciousness Studies, 1(1), 91–118.
[7] Ruyant, Q., 2010. Quantum Physics and the Ontology of Mind. Journal of Consciousness Exploration & Research, 1(8).
[8] Tegmark, M., 2000. Why the Brain is Probably not a Quantum Computer. Information Sciences, 128(3–4), 155–179.
[9] Penrose, R., 1994. Shadows of the Mind, Vol. 4. Oxford University Press: Oxford, UK.
[10] Goswami, A., 1990. Consciousness in Quantum Physics and the Mind-Body Problem. The Journal of Mind and Behavior, 11(1), 75–96.
[11] Pylkkänen, P., 2010. Implications of Bohmian Quantum Ontology for Psychopathology. NeuroQuantology, 8(1), 37–48.
[12] Amoroso, R.L., 1997. The Theoretical Foundations for Engineering a Conscious Quantum Computer. In: Gams, M., Paprzycki, M., Wu, X., (Eds.). Mind Versus Computer, Were Dreyfus & Winograd Right? IOS Press: Amsterdam, The Netherlands. pp. 141–155.
[13] Ricciardi, L.M., Umezawa, H., 1967. Brain and Physics of Many-Body Problems. Kybernetik, 4(2), 44–48.
[14] Penrose, R., 1996. Shadows of the mind: a search for the missing science of consciousness. Oxford University Press: New York, NY, USA.
[15] Valverde, R., 2018. Quantum Theory, Consciousness, God & the Theology of the Urantia Book. Scientific GOD Journal, 2, 9(6).
[16] Mitchell, E.D., Staretz, R., 2011. The quantum hologram and the nature of consciousness. Journal of Cosmology, 14(1), 1–19.
[17] Schempp, W., 1999. Sub-Riemannian Geometry and Clinical Magnetic Resonance Tomography. Mathematical Methods in the Applied Sciences, 22(11), 867–922.
[18] Marcer, P.J., Schempp, W., 1999. Quantum holography—the paradigm of quantum entanglement. AIP Conference Proceedings, 465, 461–467.
[19] Marcer, P, Mitchell, E., 2001, What is consciousness. The Physical Nature of Consciousness, 7, 358–401.
[20] Mitchell, E., 1996. A Dyadic Model of Consciousness. World Futures: Journal of General Evolution, 46(2), 69–78.
[21] Hernandez, R., Davis, R., Schild, R., 2018. A Study on Reported Contact with Non-Human Intelligence Associated with Unidentified Aerial Phenomena. Journal of Scientific Exploration, 32(2), 298–348.
[22] Grinberg-Zylberbaum, J., Delaflor, M., Arellano, M.S., 1993. Human Communication and the Electrophysio-

logical Activity of the Brain. Subtle Energies & Energy Medicine Journal Archives, 3(3).

[23] Paul, J., 2019. Future is not Separate from the Present or the Past: Can Temporal Nonlocality in Quantum Entanglement Explain Retrocausality (Effect Preceding the Cause). Precognition and Déjà vu? Journal of Emerging Technologies and Innovative Research, 6(5), 304–311.

[24] Schrödinger, E., 1967. Letters on Wave Mechanics: Schrödinger, Planck, Einstein, Lorentz.

[25] Smith, Q.J., Valverde, R., 2021. A Perceptron Based Neural Network Data Analytics Architecture for the Detection of Fraud in Credit Card Transactions in Financial Legacy Systems. Wseas Transactions on Systems and Control, 16, 358–374.

[26] Martial, C., Simon, J., Puttaert, N., et al., 2020. The Near-Death Experience Content (NDE-C) Scale: Development and Psychometric Validation. Consciousness and Cognition, 86, 103049.

[27] Stapp, H.P., 1999. Attention, Intention, and Will in Quantum Physics. Journal of Consciousness Studies, 6(8–9), 143.

[28] Ponte, D.V., Schäfer, L., 2013. Carl Gustav Jung, Quantum Physics and the Spiritual Mind: A Mystical Vision of the Twenty-First Century. Behavioral Sciences, 3(4), 601–618.

[29] Tyler, C., 2015. The Emergent Dualism View of Quantum Physics and Consciousness. Cosmos and History: The Journal of Natural and Social Philosophy, 11(2), 97–114.

[30] Beck, T.E., Colli, J.E., 2003. A Quantum Biomechanical Basis for Near-Death Life Reviews. Journal of Near-Death Studies, 21(3), 169–189.

[31] Charland-Verville, V., Ribeiro de Paula, D., Martial, C., et al., 2020. Characterization of Near Death Experiences Using Text Mining Analyses: A Preliminary Study. PLoS one, 15(1), e0227402.

[32] Flanagan, J.C., 1954. The Critical Incident Technique. Psychological Bulletin, 51(4), 327.

[33] Dennett, D.C., 2017. Consciousness Explained. Little Brown & Company: Boston, MA, USA.

[34] Mcginn, C., 2004. The problem of consciousness: essays towards a resolution. Blackwell: Oxford, UK.

[35] Koch, C., Crick, F., 1994. Some Further Ideas Regarding the Neuronal Basis of Awareness. In: Koch, C., Davis, J.L. (Eds.). Large-Scale Neuronal Theories of the Brain. The MIT Press: Cambridge, MA, USA; London, UK. p. 93.

[36] Long, J., Perry, P., 2011. Evidence of the afterlife : the science of near-death experiences. Harperone: New York, NY, USA.

[37] Rosario, C., Marco, F., Michela, Q., 2014. An Ontology-Based Framework for Semantic Data Preprocessing Aimed at Human Activity Recognition. In the Eighth International Conference on Advances in Semantic Processing, SEMAPRO; Rome, Italy, 24–28 August 2014.

[38] Valverde, R., Toleman, M., Cater-Steel, A., 2010. A method for comparing traditional and component-based models in information systems re-engineering. Information Systems and e-Business Management, 9(1), 89–107.

[39] Valverde, R., Swanson, C., 2021. Development of a Quantum-based Ontology for Describing NDE by Using Computerized Natural Language Processing. Journal of Consciousness Exploration & Research, 12(3).

[40] Valverde, R., Swanson, C., 2022 . The Development of a Quantum-based Ontology for the Description of the Reality Experienced in NDEs by Using Computerized NLP Analytics. NeuroQuantology, 20(2), 10–22.

[41] Siddiqi, S., Sharan, A., 2015. Keyword and Keyphrase Extraction Techniques: a Literature Review. International Journal of Computer Applications, 109(2), 18–23.

[42] Rodrıguez, J.B., Corcho, Ó., Gómez-Pérez, A., 2004. R2O, an extensible and semantically based database-to-ontology mapping language. Facultad de Informática (UPM) eBooks. Available from: http://www.cs.man.ac.uk/~ocorcho/documents/SWDB2004_BarrasaEtAl.pdf

[43] Liddy, E.D., 2001. Natural language processing Encyclopedia of Library and Information Science. Marcel Decker. Inc.: New York, NY, USA.

[44] Ali, M., 2003. NLTK Sentiment Analysis Tutorial: Text Mining & Analysis in Python [Internet]. Available from: https://www.datacamp.com/tutorial/text-analytics-beginners-nltk

[45] Barrad, S., Gagnon, S., Valverde, R., 2020. An Analytics Architecture for Procurement. International Journal of Information Technologies and Systems Approach, 13(2), 73–98.

[46] Nef, T., Urwyler, P., Büchler, M., et al., 2015. Evaluation of Three State-of-the-Art Classifiers for Recognition of Activities of Daily Living from Smart Home Ambient Data. Sensors, 15(5), 11725–11740.

[47] Van Kasteren, T., Alemdar, H.Ö., Ersoy, C., 2011. Effective Performance Metrics for Evaluating Activity Recognition Methods. ARCS Workshops.

[48] Sokolova, M., Lapalme, G., 2009. A Systematic Analysis of Performance Measures for Classification Tasks. Information Processing & Management, 45(4), 427–437.

[49] Salguero, A.G., Espinilla, M., Delatorre, P., et al., 2018. Using Ontologies for the Online Recognition of Activities of Daily Living. Sensors, 18(4), 1202.

[50] Das, S., Chong, E.I., Eadon, G., et al., 2004. Supporting ontology-based semantic matching in RDBMS. In Proceedings of the 30th International Conference on Very Large Data Bases Conference; Toronto, ON, Canada, 31 August–3 September 2004; pp. 1054–1065.

[51] Hameroff, S., 2007. Orchestrated Reduction of Quantum Coherence in Brain Microtubules: A Model for Consciousness. NeuroQuantology, 5(1).

[52] Valverde, R., Swanson C., Sepehri, A., et al., 2024. Quantum Intelligence in Penrose's Space-Time Geometry and Its Relation to Non-Human Intelligence Contacts and Human Immortality: An Alternative to the Orch-OR Model. The International Journal of Multiphysics, 18(3), 1213–1219.

[53] Valverde, R., 2015. Neurotechnology as a Tool for Inducing and Measuring Altered States of Consciousness in Transpersonal Psychotherapy. NeuroQuantology, 13(4), 1–16.

[54] Valverde, R., 2022. Transpersonal Psychology: Altered States of Consciousness, Biofeedback and Neurotechnology. Bentham Science Publishers: Amersfoort, Ethiopia.

[55] Grinberg-Zylberbaum, J., 1997. Ideas about a new psychophysiology of consciousness: The syntergic theory. The Journal of mind and behavior, 18(4), 443–458.