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The Theory of a Natural Eternal Consciousness: Addendum

Bryon K. Ehlmann

Southern Illinois University Edwardsville

The *theory of a natural eternal consciousness* (NEC) states that human consciousness is not extinguished with death but merely imperceptibly paused. That is, the last conscious moment of the last experience of a person becomes imperceptibly timeless and deceptively eternal from their perspective. Moreover, if that experience is a vision, dream, or near-death experience and is perceived as an afterlife, then the NEC is a *natural afterlife*. An earlier article by Ehlmann (2020) explains the NEC theory and claims its validity. This addendum provides a brief overview of that article but, more significantly, offers these enhancements: (1) an easier to grasp description of the notation used to formally define the NEC and natural afterlife; (2) an extension to this notation to formally define the *eventually timeless natural afterlife* (etna) — a time-perceiving, activity-filled afterlife that concludes with the timeless natural afterlife and can provide optimal eternal happiness; (3) greater focus on the validity of the NEC theory: the role of self-awareness, the theory of paused consciousness in timelessness (PCT) and its everyday verification, and the improbable falsification of the NEC theory as a hypothesis to the PCT theory; and (4) a new diagram that summarizes the meanings of NEC-related terms and the relationships among them.

Keywords: death and dying, natural eternal consciousness (NEC), natural afterlife

This article is an addendum to Ehlmann (2020), entitled "The Theory of a Natural Eternal Consciousness: The Psychological Basis for the Natural Afterlife." This earlier article discusses the *natural eternal consciousness* (NEC) *theory* in detail. More specifically, the article (1) hypothesizes an NEC based on cognitive science principles, (2) provides thought experiments that invoke human experiences to suggest the essence and reality of the NEC, (3) formally defines the NEC and its related natural afterlife based on a model that allows all conscious moments and timeless periods within a lifetime to be represented, (4) precisely states and logically deduces the NEC theory based on both cited and well-established cognitive

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science principles, (5) establishes the validity of the theory as a scientific theory given that the NEC exists in the mind before death and thus can be verified or falsified, and (6) generally compares the natural afterlife with traditional views of an afterlife.

The NEC theory significantly contributes to our understanding of consciousness and death. The theory is the first that boldly proclaims that human consciousness is not extinguished at death but, from the perspective of the dying, only imperceptibly paused. It overturns centuries of orthodoxy concerning the afterlife. The view that there is no afterlife and that death merely returns us to the nonexistence of our before-life is debunked. The views that an afterlife must be supernatural and full of events that last an eternity and that it has to be such for eternal bliss are also debunked. The boldness of such revelations must be backed by sound principles, analysis, a precise definition of terms, and validation. This was the purpose of the earlier article. The main purposes of this article are to bolster this support and present some new related concepts.

Most of the first section of this article extracts from or summarizes parts of the earlier article to provide a brief overview of the NEC theory.[1] The last few paragraphs of the section provide additional insight by comparing the NEC and natural afterlife to a timelessly eternal afterlife that is similar to the natural afterlife and was first speculated in 1995 by psychology scholar Harry T. Hunt. The sections that follow the overview present enhancements to the earlier article.

Overview

The psychological principles upon which the NEC theory is based are established cognitive science principles concerning time and conscious perception. Ehlmann (2020) discusses them in detail but introduces them in the second of two hypotheses, which is given below. The first hypothesis is the orthodox view that all consciousness ends at death.

> Hypothesis 2. For decades evidence has been mounting that we perceive time as a sequence of events, each evolving one discrete, present conscious moment at a time (Elliott and Giersch, 2016). Outside of these moments (e.g., dreamless sleep), we perceive nothing. Before death, a still functioning brain produces one last present moment of a perceived event within some experience, perhaps a dream, and then is incapable of ever producing another moment that would cognitively supplant the last one from our consciousness. Therefore, we never perceive and thus are never aware that our last experience is over. So a remnant of consciousness, an experience paused in a moment at a point in time, will become imperceptibly timeless, i.e., *static*, and deceptively eternal *relative to our perspective*. (Ehlmann, 2020, p. 55)

[1] The reader should read Ehlmann (2020) if more detailed explanations or justification for the theory are desired.

Via analysis, deduction, and an exposition of testing feasibility, Ehlmann (2020) promotes this hypothesis to a theory as stated below:[2]

> The natural eternal consciousness (NEC) of a creature with human-like time and conscious perception is, relative to the creature's perception, its final conscious moment. The NEC may be perceived as a natural afterlife. (p. 58)

Thought experiments in Ehlmann (2020) invoke the experience of waking up from a period of timelessness (e.g., dreamless sleep) and immediately being surprised when your first conscious moment is vastly different from your last. Examples are waking up from a dream, waking up from falling asleep while watching a TV show, and waking up in the recovery room from general anesthesia. Regarding a dream, you never know it's over until you wake up, but suppose you never do? How will you ever know the dream is over? The answer is: you will not. Two important things to note about dreams — as well as hallucinations, i.e., visions, and near-death experiences (NDEs) — are that, first, though the settings, plots, and characters are not real, they can be all too real to the experiencer and second, the emotions that are evoked by the experience are indeed real, which is why you can wake up from a nightmare trembling in fear (Brumfield, 2013; Holden, Greyson, and James, 2009; Thonnard et al., 2013). But again, suppose you never wake up?

The following thought experiment elicits the essence of an NEC that is a natural afterlife:

> You are having what you will call your NDE should you recover. In this very profound, all too real experience, you are overcome by marvelous feelings of wonder, love, and contentment. You truly believe that you have died and are experiencing heaven, and you are excitedly anticipating the next moment and an eternity of joyful experiences. (Ehlmann, 2020, p. 60)

If you never recover, i.e., wake up, this will be your NEC and natural afterlife. You believe you are in heaven, and for all eternity you will never know otherwise.

The essence of the NEC can be described as natural, relativistic, timeless, and eternal. It is natural, i.e., there is nothing supernatural about it, because it is supported by science — specifically, psychology and more specifically, cognitive science. It is relativistic because to grasp it, it must be viewed from the proper psychological frame of reference, that of the dying person, not the material frame of reference, that of the living. It is also relativistic because its content is relative

[2] Though "hypothesis" and "theory" have stricter meanings in a scientific context than in common usage, the given scientific meanings are still sometimes at odds. For example, one article states "Every scientific theory starts as a hypothesis" (Bradford, 2017) while another states "hypotheses never become theories" (Gregory, 2008, p. 48).

to the individual. It is timeless because it is one discrete conscious moment that never changes, a snapshot of an experience embodying all of the sensations, feelings, and emotions present at a point in time. But it is *imperceptibly* timeless because, like all other moments, it is never perceived as static but only as part of a stream of moments wherein each includes the anticipation of another to follow. It is eternal because what follows is only timelessness wherein no more events occur (barring some supernatural afterlife) and thus no moment to replace the final moment within the consciousness as the present moment. But it is *deceptively* eternal because the dying person does not perceive their moment of death and thus is not aware that in reality, the final experience has ended along with all material consciousness. Given the lack of perception as well as the deception taking place within the mind, the NEC can be seen as an end-of-life illusion.

A few important aspects of the NEC theory should be emphasized. First, it assumes that any NDE ends at death instead of begins with death. Those who believe the latter, believe that those reporting an NDE have returned from death (e.g., Long, 2010; Moody, 2001; van Lommel, 2010). Second, the theory specifies only what the *default* after-life is, meaning it could be replaced later by some kind of supernatural afterlife.[3] Thus, the theory is religiously neutral. And third, the NEC is a natural afterlife only when the dying person perceives their final experience — be it a vision, dream, or NDE — as an afterlife. The natural afterlife, unlike no other traditionally envisioned afterlife, begins before death and is timeless (i.e., no events occur, nothing happens). As such and as Ehlmann (2020) argues, it alone, unlike any other envisioned afterlife, is supported by science and is logically consistent.

Figure 1, not found in Ehlmann (2020), provides a review of NEC theory concepts. It shows, in real time, a person's last experience (here an NDE), death, and after-life. The last experience is composed of activities (*a*s), which are composed of events (*e*s), which are composed of conscious moments (*m*s). The last activity is broken down into its events, and the last event is broken down into its moments. The NDE begins (denoted by ˇ) after a period of *Timelessness* and ends (again denoted by ˇ) after some last moment of some event of some activity. The NDE either ended naturally or ended because a deteriorating brain was incapable of producing another NDE moment. A period of *Timelessness* precedes death (again denoted by ˇ). The NEC and the natural afterlife, here assumed, begin with the last moment. The *etna*, the acronym for an *eventually timeless natural afterlife*, begins with the first NDE activity.[4] The etna is discussed in a later section.

The notation used in Figure 1 to represent perceived events (*e*s), moments (*m*s), and imperceptible events (ˇs) gives a taste of that used in the NEC notation of the lifetime-in-eternity model. Imperceptible events transition one into a state

[3] The term "after-life" with a hyphen is used to mean the period of time after death. It is not the same as "afterlife."

[4] The acronym etna is pronounced as is the volcanic mountain in Sicily, Mount Etna.

of timelessness (e.g., "end NDE" or "death") or from a state of timelessness into a state of consciousness (e.g., "begin NDE").

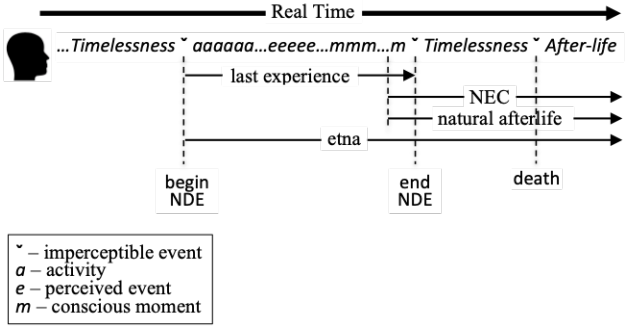


Figure 1: The relationships in real time among NEC-related concepts: one's last experience (here an NDE); its activities, events, and moments; the NEC (here assumed a natural afterlife); and the etna. The NEC, natural afterlife, and etna continue eternally, but only subjectively.

The conclusion to this overview credits the work of psychologist Harry T. Hunt and discusses the afterlife he envisioned.[5] Hunt (1995, pp. 252–256; 2012) deduces the possibility of an NDE-related afterlife with an essence similar to the natural afterlife. Hunt bases his potential afterlife on transpersonal (spiritual) psychology, ideas in phenomenology, and studies of NDEs and other mystical experiences. Hunt (2012, pp. 24–25) reasons (selectively quoting, with some explanation by this author given in brackets):

> As long as … each moment of our humanly self-aware consciousness contains … its perpetually felt sense of "not yet," carrying forward [the anticipation of another moment], … from a first-person [dying person] point of view, which is all we have in this terminal situation [death], we indeed cannot die. Here … "third person" [non-experiencing person] issues of truth versus illusion have become irrelevant phenomenologically [from the experiencer's perspective].… Meanwhile, extrapolating from the near-death literature, experience would become more and more fundamental as physiological arousal attenuates, with a concomitant phenomenal sense of timeless eternity.

Note that a "sense of timeless eternity" is not present in the NEC. In the NEC, eternity is sensed by the dying, deceptively so; however, its timeless essence is not, for it is imperceptible to the dying person.

[5] Hunt informed me in January 2021 of his envisioned afterlife and its similarity to the natural afterlife. With his help, over multiple emails, I came to understand his work better so as to more accurately describe its relationship to mine.

Also, note that the NEC is based on cognitive science principles that are always applicable at death, while the afterlife that Hunt hypothesizes is based on the presence at death of subjective feelings of timeless eternity within mystical experiences. While the NEC is not dependent on such experiences, the natural afterlife often results from such (e.g., NDEs).

Nevertheless, despite differences with the NEC (terminology definitely included!), I maintain that Hunt's afterlife lends support to the NEC theory. It shows another route to almost the exact realization taken by someone with a very different scholarly background than that of this author.

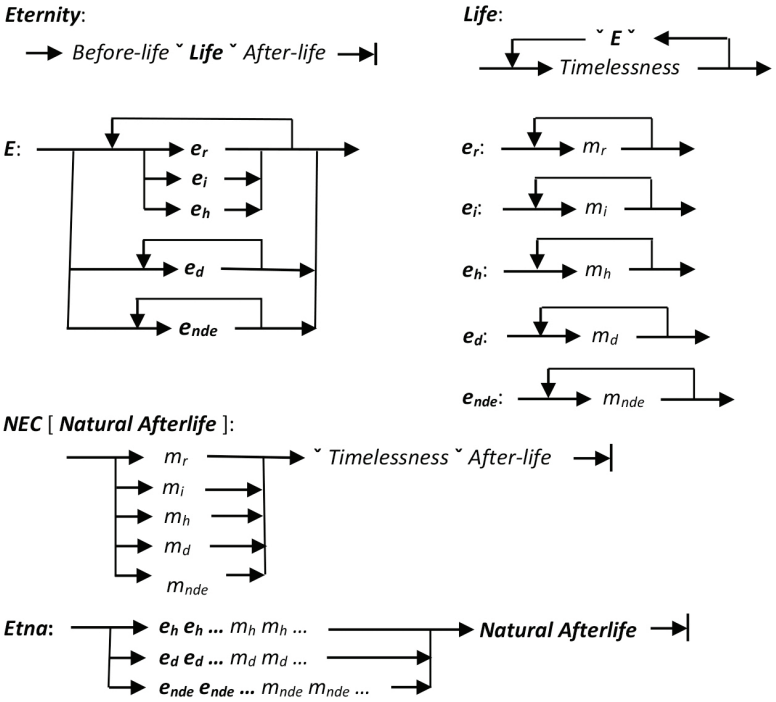
NEC Notation

The NEC notation, described in Table 1, provides the detailed *moment*-level of the *lifetime-in-eternity model*. This model supports the NEC theory and allows the NEC and natural afterlife to be formally defined. In Ehlmann (2020) the syntax of this notation is described via a revised Bachus–Naur Form, which is often used to define programming languages. Here, the same notation is defined via railroad diagrams, a less mathematical, more graphical technique. Also, the NEC notation is extended to formally define the etna — a significant topic of this article, which is thoroughly discussed in the next section. The notation is further extended, but only slightly and hypothetically, to discuss some suggested neurological testing. This discussion takes place in the section on validity.

The lifetime-in-eternity model, given in Ehlmann (2020), allows all conscious moments and all periods of timelessness (e.g., dreamless sleep) that occur within a lifetime to be represented. The model places a lifetime in the context of eternity by also representing the timelessness of the before-life and after-life. State diagrams provide the more abstract *event*-level of the model. The diagrams show states (and substates) of mind — e.g., Awake, Not Awake, Dreamless, Dreaming — and the imperceptible events that transition into and out of these states — e.g., "fall asleep" (or "pass out") and "wake up," respectively, for Not Awake or "begin dream" and "end dream" for Dreaming (a substate of Not Awake). States are time-perceiving wherein events are perceived (e.g., Awake or Dreaming) or they are timeless wherein no events are perceived (e.g., Before-life, After-life, or Dreamless, a substate of Not Awake). Examples of perceived events are the blink of an eye, the slightest detectable movement of a thrown ball, and a spoken syllable. Perceived events are made up of static conscious moments, each produced by the brain about once every twentieth of a second (Elliott and Giersch, 2016). A sequence of such moments provides our stream of consciousness — one moment replacing another as our present moment, like the frames of a film or the railroad cars of a passing train. So, perhaps it is not coincidental that "railroad diagrams" are used to define the NEC notation.

Table 1
Lifetime in Eternity Model: NEC Notation

Syntax. To represent all conscious moments and periods of timelessness before, within, and after a life, begin by traversing the railroad diagram labelled ***Eternity***. When traversing a diagram, follow the arrows taking the proper paths as needed. When you come to a term in bold, e.g., ***Life*** or ***E***, go to its defining diagram, traverse it, and when you come to its end, return back to the diagram you left and continue on. When you come to the end of ***Eternity*** (denoted by |), you are done and have already traversed the second last diagram, which formally defines the ***NEC***, and if it is a ***Natural Afterlife***, the last diagram, which formally defines the ***Etna***.



Semantics. The paragraphs below define the meanings of all terms and symbols.

Eternity – time eternal as related to a lifetime. Specifically, the span of time before one's life (denoted by *Before-life*), followed by an imperceptible event (denoted by a ˇ), which here is birth or near-birth, followed by a lifetime (denoted by ***Life***), followed by another imperceptible event ˇ, which here is death, followed by the span of time after one's life (denoted by *After-life*).

Life – a lifetime. Specifically, a span of real time (denoted by *Timelessness*) wherein no events are perceived. This may (or may not) be followed one or more times by

continued

Table 1 (continued)
Lifetime in Eternity Model: NEC Notation

an imperceptible event (ˇ) that ends the timelessness (wake up, begin dream, or begin NDE), then an experience (denoted by ***E***), and then another imperceptible event (ˇ) that again results in timelessness (fall asleep, pass out, end dream, or end NDE). The types of the two events, e.g., begin dream and end dream, are consistent with the type of the experience, e.g., dream. (*Timelessness* may occur over one or more contiguous timeless states of mind involving imperceptible transitioning events.)

E – an experience of a type matching its perceived events. Specifically, a series of (one or more) awake events — which can be real, imaginary, or hallucinatory (i.e., visionary) events (each denoted by e_r, e_i, and e_h, respectively) — or a series of dream events (each denoted by e_d) or a series of NDE events (each denoted by e_{nde}).

e_r – an event consisting of a series of real conscious moments (each denoted by m_r). Ditto for e_i, e_h, e_d, and e_{nde} and a series of imaginary, hallucinatory, dream, and NDE conscious moments (each denoted by m_i, m_h, m_d, and m_{nde}), respectively.

NEC [***Natural Afterlife***] – the natural eternal consciousness (NEC), possibly a natural afterlife (denoted by the brackets). Specifically, the last moment of a ***Life*** — m_r, m_i, m_h, m_d, or m_{nde} — followed by an imperceptible event (ˇ), e.g., pass out or end NDE, that results in *Timelessness* (possibly multiple periods) followed by an event (ˇ), here death, followed by the *After-life*.

Etna – the eventually timeless natural afterlife (etna). Specifically, a series of events where the last event can be interrupted after any moment by death. The events and the moments, including the last moment that begins the ***Natural Afterlife***, are all of the type hallucinatory, dream, or NDE.

Example. The notation below represents the end of a life (***Life***) and the after-life (*After-life*) that follows. A ... indicates zero or more like moments that are not shown. *Tln* is used as an abbreviation for *Timelessness*.

$$...m_r m_r...m_r m_i m_i...m_i \check{} Tln \check{} m_d m_d...\underline{m_d \check{} Tln} \check{} m_r m_r...m_r \check{} Tln \check{} m_d m_d...m_d \check{} Tln \check{} After\text{-}life$$

$$|\longleftarrow \textbf{\textit{NEC}} \longrightarrow|$$

$$[\textbf{\textit{Natural Afterlife}}]$$

$$|\longleftarrow\!\!\longleftarrow [\textbf{\textit{Etna}}] \longrightarrow\!\!\longrightarrow|$$

A person is awake, alert (m_rs) and imagining (m_is), falls asleep (ˇ), begins a dream (ˇ), dreams (m_ds), ends the dream (ˇ), wakes up (ˇ), is alert (m_rs), passes out (ˇ) with a heart attack, begins a dream (ˇ), dreams (m_ds), ends the dream (ˇ), and dies (ˇ). The ***NEC*** may be perceived as a ***Natural Afterlife***. Note that the m_d is perceived as the present in the ***NEC*** just as an m_d is perceived as such in the underlined *Tln*, except in the ***NEC*** it is perceived as the present forever because the person never wakes up.

If the ***NEC*** is perceived as a ***Natural Afterlife***, the preceding moments ($m_d m_d$...) and the ***NEC*** makeup the ***Etna***. These moments form the events (e_ds) that form the activities within the final dream experience (***E***). Note that the m_ds within the ***Etna*** could just as well have been m_hs or m_{nde}s within a final hallucination or NDE, respectively.

These diagrams are given in Table 1 along with: the directions for traversing them, the semantics (i.e., meanings) of all terms and symbols in them, and an example of their use to represent one person's end of life and after-life. Each diagram is labelled with a *nonterminal* term given in bold (e.g., ***Life*** or $\boldsymbol{e_r}$) and defines the syntax (i.e., structure) of that term. Its meaning is explained under Semantics. What is central to the purpose of Table 1 is explained in the remainder of this section.

If you traverse the diagrams as directed to represent some lifetime in eternity, likely billions of conscious moments, i.e., *m*s, and tens of thousands of ˇs and *Timelessness* periods will result, as passing over these *terminals* "generates" them. Also, you will always end up with — i.e., all tracks lead to — one of these possible representations for the end of life:

m_r ˇ *Timelessness* ˇ *After-life*

m_i ˇ *Timelessness* ˇ *After-life*

m_h ˇ *Timelessness* ˇ *After-life*

m_d ˇ *Timelessness* ˇ *After-life*

m_{nde} ˇ *Timelessness* ˇ *After-life*

These are the same representations that can result from traversing the railroad diagram in Table 1 labelled ***NEC [Natural Afterlife]***, which provides the formal definition of the NEC and natural afterlife, its possibility denoted by the brackets. This definition describes how all lives will end. m_r, m_i, m_h, m_d, and m_{nde} denote one's last conscious moment — real, imaginary, hallucinatory (i.e., that of a vision), dream, and nde (NDE), respectively. m_r, m_i, and m_h are awake moments. Following this moment, the first ˇ in each representation denotes an imperceptible event that transitions one into *Timelessness*. This event is consistent with the type of the preceding moment and can be "fall asleep," "pass out," "end dream," "end NDE," or an abnormal failure type of event occurring in a deteriorating brain that results in it no longer being able to produce another moment of the type that is being experienced. Such failure events are discussed in more detail in Ehlmann (2020). The timelessness that follows the first ˇ never ends because the next ˇ denotes the event "death," which transitions one into the timelessness of the *After-life*.

Besides providing for the NEC's formal definition, the NEC notation shows that, cognitively, the timelessness in the NEC, with its preceding conscious moment as the present throughout, is the same as that which occurs numerous times in life. The example NEC notation given in Table 1 is repeated below, where *Tln* abbreviates *Timelessness*.

$\ldots m_r m_r \ldots m_r m_i m_i \ldots m_i$ˇ *Tln*ˇ $m_d m_d \ldots \underline{m_d}$ˇ *Tln*ˇ $m_r m_r \ldots m_r$ˇ *Tln*ˇ $m_d m_d \ldots m_d$ˇ *Tln*ˇ *After-life*

For the person depicted by this notation, perceiving m_d as the present throughout the NEC, denoted by m_dˇ *Tln*ˇ *After-life*, is the same as, when alive, perceiving a

last dream moment, m_d, as present before waking up. This situation is denoted by m_d˅ *Tln* — which is underlined and denotes a dream moment, an imperceptible "end dream" event, and the timelessness that here precedes waking up. The only difference is that the person wakes up from the underlined m_d˅ *Tln* — i.e., an m_r, a real awake conscious moment, is perceived after a common dream.

Etna

The final railroad diagram in Table 1 has been added to the NEC notation given in Ehlmann (2020) to formally define the etna. The etna is a natural *eventually timeless afterlife* (*eta*), thus an eventually timeless *natural* afterlife. An eta is an afterlife wherein events, and thus activities, occur but which eventually becomes timeless, i.e., eventless. An eta could be *supernatural* in that it occurs after death. The etna, however, is natural in that it is an afterlife as perceived by the dying person and it begins with the last experience *before* death and concludes with the natural afterlife, the moment of death being imperceptible.

The eta and etna were defined to emphasize that, from the perspective of a dying person, the NEC makes possible an afterlife that has activities, just like a traditionally envisioned afterlife. As discussed in Ehlmann (2020), *end-of-life dreams and visions* (ELDVs) [Kerr et al., 2014] and NDEs are more likely to result in a natural afterlife than other final experiences. Although the natural afterlife is imperceptibly timeless, from a dying person's perspective, it is a time-perceiving afterlife, i.e., one in which events do indeed occur. They just occur before death within the ELDV or NDE and imperceptibly end with death. This eventually timeless afterlife, i.e., eta, has always been implicit in the NEC theory, just not identified and discussed.

In Table 1, an etna (*Etna*) is defined as one of the three representations below. (Terms in bold are further defined by another railroad diagram.)

$$\boldsymbol{e_h}\ \boldsymbol{e_h} \ldots \boldsymbol{e_h}\ m_h\ m_h \ldots \textbf{\textit{Natural Afterlife}}$$
$$\boldsymbol{e_d}\ \boldsymbol{e_d} \ldots \boldsymbol{e_d}\ m_d\ m_d \ldots \textbf{\textit{Natural Afterlife}}$$
$$\boldsymbol{e_{nde}}\ \boldsymbol{e_{nde}} \ldots \boldsymbol{e_{nde}}\ m_{nde}\ m_{nde} \ldots \textbf{\textit{Natural Afterlife}}$$

The etna begins with the first event of the last experience — i.e., the first $\boldsymbol{e_h}$, $\boldsymbol{e_d}$, or $\boldsymbol{e_{nde}}$ listed above — and ends with the ***Natural Afterlife***. The sequence of events that forms the last experience is shown where only the last is broken down into its discrete moments (though traversing the NEC notation generates the moments of all events). The discrete moments of the last event are shown because this event can be imperceptibly interrupted by the onset of death after any moment. The last moment of life — m_h, m_d, or m_{nde} — is not shown in the *Etna* representations as it is defined as the beginning of the ***Natural Afterlife*** and thus can be seen in the representations given for the ***NEC [Natural Afterlife]***.

The example given in Table 1 shows a lifetime that concludes with a possible etna based on a dream; however, the m_ds could just as well have been m_hs or, perhaps more likely, m_{nde}s. Here, m_ds were chosen because this sequence occurs many times in life and so forms the basis for probably the best thought experiment that allows one to envision the NDE, natural afterlife, and etna — which, as discussed in the Overview, is imagining that you never woke up from a dream.

Just to be clear, the etna, which is time-perceiving, culminates with the natural afterlife, which is timeless. Perhaps surprisingly, but logically, the following can be stated:

> Any afterlife that is perfect, i.e., provides optimal eternal happiness, must be an eventually timeless afterlife, an eta.

Call this statement the *eta principle for a perfect afterlife*.

The argument for this principle is twofold. First, any eternal, time-perceiving, perfect afterlife that allows free will — i.e., decisions, which require time — is illogical. As stated in Ehlmann (2016, p. 935), where Δt means "a change in time":

> … in any time-perceiving ($\Delta t > 0$) perfect world, free will is impossible as imperfect decisions would introduce imperfection, perhaps even evil. Though without free will in such an infinite ($\Delta t = \infty$) world, boredom is most likely as there will be no decisions to make and no challenges [as it's already perfect]. Apparently, *any* eternal afterlife wherein a time-perceiving consciousness survives death must be either imperfect or logically inconsistent.

Logic thus dictates that any perfect afterlife be eventually timeless; otherwise, it becomes boring. Second, the feelings and emotions that are aroused by the events of pleasurable experiences are what constitute happiness, not the events themselves. Once the events have provided optimal happiness and any thought that it will ever end is absent, more events can only result in less, not more, happiness. Feelings and emotions separate humans from most other forms of life, and with the natural afterlife, they are present, timeless, eternal, and *real* in the end. Therefore, the etna, as an eta and unlike any other afterlife known to this author, allows a progression of events to climax into a glorious moment of maximum happiness and then be forever frozen in the consciousness.

Validity

Some who have read about the NEC theory have tried to refute its validity via analogy. They likened the human mind to a computer and claimed that like the computer, once the mind loses "power," it loses all functionality and thus all "consciousness." This, however, is a false analogy in that a computer is not like a human in two very relevant aspects.

First, the computer lacks self-awareness (or meta-awareness). It has no awareness, i.e., knowledge, of its self and of that which it is aware or conscious, i.e., of its current state. For example, if a computer is generating the tenth digit of pi (just as we might be doing by hand), it does not *know* it is doing so as we would know. That is, it never thinks to itself (or believes) "I'm now generating the tenth digit of pi." Thus, with the loss of power, it is not left with the illusionary knowledge, i.e., belief, that it is still experiencing its final state, e.g., generating that tenth digit, like a dying person is left with the belief that they are still experiencing their last conscious moment and thus experience.

Second, a computer lacks the feelings and emotions, e.g., pain and love, that are present in human consciousness and arise from self-awareness. That is, it never feels good about its accomplishments or loves what it is doing. It is the self-awareness part of our consciousness that plays a major role in creating our NEC.

Ehlmann (2020) states that the NEC theory is a scientific theory as it can be verified or falsified before death. Indeed, it is tested and verified every time someone awakes from a period of timelessness instantly surprised when their first awake moment is inconsistent with their last present one (as in waking up from a dream) or fascinated that they never knew their last experience had ended (as in waking up from general anesthesia). Such *subjective* preservation of one's present, including self, during timelessness, independent of memory, can be seen as no more than the imperceptible, temporary loss of the perception of any new present moment to replace the former within one's self-awareness.

This preservation of the present can also be seen as the *theory of paused consciousness in timelessness* (PCT), which is not defined in Ehlmann (2020) but is stated below along with a clarifying paragraph.

> The consciousness of a creature with human-like time and conscious perception is, relative to the creature's perspective, imperceptibly paused in its last conscious moment during periods of timelessness and resumed with the next conscious moment.
>
> The last conscious moment is not remembered upon resumption of consciousness and it need not be as it is still the present; however, soon afterward, it may be forgotten due to some combination of its being mundane and the creature's attention being immediately focused on subsequent moments and events.

It is the above theory, the PCT theory for short, not the NEC theory, that is actually being tested and verified by the everyday occurrences described in the previous paragraph.

However, once the validity of the PCT theory is established, the NEC theory can be treated as a hypothesis based on it. In Ehlmann (2020), the NEC theory is deduced based on three cognitive science principles. The PCT theory can be deduced based on these same principles. It, however, does not specifically address death but instead is more general in addressing many situations in life.

So, the new approach taken in this article, which much simplifies the deduction of the NEC theory, is to first establish the validity of the PCT theory and then based on it, establish the validity of the NEC theory by addressing the situation when "the next conscious moment" never occurs, i.e., death.

Regarding the hypothesis vs. theory conundrum (see footnote 2 in the Overview), the NEC theory started as a hypothesis (see Hypothesis 2 in the Overview). It was established as a scientific theory by Ehlmann (2020). Thus, it meets the edict that "Every scientific theory starts as a hypothesis" (Bradford, 2017). Now it is being treated as a hypothesis based on the PCT theory. Thus it meets the definition of a hypothesis as "an empirically testable proposition about some fact, behavior, relationship, or the like, usually based on theory, that states an expected outcome resulting from specific conditions …" (APA, 2020). Here the "specific conditions" are that (1) the creature has human-like time and conscious perception, (2) it enters a period of timelessness, and (3) it never has a next conscious moment, i.e., it dies. The "expected outcome" is that its final conscious moment becomes its NEC and possibly its natural afterlife.

The three cognitive science principles from which the PCT theory can be deduced are discussed in detail in Ehlmann (2020). Here they are briefly described. First is that the perception of time is dependent on, i.e., relative to, a perceived, ordered sequence of events. The types of these events are identified in the NEC notation. When events are no longer perceived, one enters a state of timelessness (e.g., dreamless sleep). This state is denoted as *Timelessness* in the NEC notation. The second principle is that consciousness, i.e., perception and awareness, occurs only as a sequence of discrete, static conscious moments, one present moment at a time, wherein past moments play a major role in shaping the totality of the present moment and another consistent moment is always anticipated but not guaranteed. The types of these moments are again identified in the NEC notation. Important to emphasize is that awareness in these moments includes self-awareness and that one is aware of only what one perceives in these moments. The third principle is the *imperceptible loss of time* when transitioning into periods of timelessness (e.g., when falling asleep). An imperceptible event that causes such a transition (e.g., "fall asleep") is denoted by ˇ in the NEC notation.

Now, given that (1) a person is aware of themself and what they are experiencing in any present conscious moment; (2) after such moment, they can imperceptibly enter a period of timelessness (e.g., dreamless sleep); and (3) in this period no more events occur, thus no more conscious moments to change awareness, then they must be imperceptibly paused in this last present conscious moment until the next conscious moment. Therefore, the PCT theory is supported by deduction.

As already indicated, the PCT theory is verified by everyday, waking up experiences, but can it be falsified, a requisite for any theory to be scientific? First, it is

falsified if it is observed that individuals waking up after a dream, NDE, or general anesthesia are not at all surprised because they were immediately aware that their dream or NDE had ended or they had passed out on the operating table, respectively. But this has never been the case. Second, it is falsified if neurological testing shows, via monitoring brain activity, that individuals waking up after a dream, NDE, or general anesthesia had immediately, *before* feeling surprised, accessed their memory to remember their last moments before transitioning into timelessness.[6] If so, then consciousness had not been paused but only regained by remembering.

Given the validity of the PCT theory until falsified and given that when one dies, one's paused consciousness will never be "resumed with the next conscious moment," one's consciousness will remain paused. Therefore, the NEC theory, as stated in the Overview, is supported by simple deduction.

But can the NEC theory be falsified? Yes, one way is to falsify the PCT theory. But failing that, the other way is by showing that consciousness is somehow, as stated by the PCT theory, "resumed again with the next conscious moment" before death. That is, neurological testing would find evidence, again via monitoring brain activity, that individuals experience another conscious moment, of a type as yet unknown to science, at or just *before* death. To facilitate discussion of such testing — which could be feasible, if not now, in the near future — the NEC notation is imagined as having an m_u and $\boldsymbol{e_u}$ — an unknown type of moment and perceived event, respectively. The event, if only a moment, would somehow signal to the dying person their death or their transition into eternal timelessness or a before-life kind of nothingness. The first, perhaps only, m_u of the $\boldsymbol{e_u}$ would immediately replace a dying person's last moment from their self-awareness as the present moment — relegating their last experience to only the possibility of remembrance, but which would now be impossible with the total loss of memory inherent in death.

Any quest for such an $\boldsymbol{e_u}$, however, is most likely futile because:

1. Any perception of death would be technically premature as the perceiver would still be alive.
2. The perceiver, i.e., one's self, would still be present in the $\boldsymbol{e_u}$, negating any true "nothingness." That is, the subjective preservation of self as present beyond death would still be maintained, and one would forever face the perception of death, a possibly gruesome prospect.

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[6] Brain activity can be monitored using brain scanning tools like electroencephalography (EGE) and functional magnetic resonance imaging (fMRI). Activity in different parts of the brain indicate differing types of brain functionality. Memory access as well as dream and possible NDE activity have been studied using both tools (e.g., Chawla et al., 2017; Noh et al., 2018; Santangelo et al., 2018). Detecting and relating brain activity to functionality will likely only improve in the future.

3. The e_u would be *perceived* — unlike all the other events that transition one into timelessness and evidence our imperceptible loss of time ("fall asleep," "pass out," "end dream," and "end NDE").
4. Brain functionality (*BF*), measured in terms of level and/or type and location of activity, is rapidly decreasing as one approaches brain death making the production and perception of any conscious moment increasingly impossible and thus scientifically unexplainable.
5. To the author's knowledge, no such $\boldsymbol{e_u}$ has ever been reported by near-death survivors and, if ever reported, would be logically contradictory to their having survived.

For these reasons, the existence of an $\boldsymbol{e_u}$ is not currently scientifically supported and thus, like the traditionally envisioned afterlife, is supernatural. The moment of death is after all a physiological, not a psychological event. This combined with the verification of the CPT theory via much human experience suggests the validity of the NEC theory until falsified.

Nevertheless, testing for an $\boldsymbol{e_u}$ would involve studying the relationship between *BF* and the types of conscious moments being perceived by those being monitored. In addition, it would involve close monitoring of *BF* in people as they approach brain death. An $\boldsymbol{e_u}$ might be identifiable when the required *BF* for each of the different types of normal conscious moments are known. The NEC theory would be falsified, at least for some individuals, if an $\boldsymbol{e_u}$ is ever found at a *BF* deemed sufficient for awareness yet unlike (and likely lower than) that of any other type of conscious moment. If always or even frequently found, the theory would be completely falsified. It would also be falsified if near-death survivors, now nearer than ever before it was thought possible, surprisingly begin reporting an $\boldsymbol{e_u}$, despite reason number 5 above. However, for all the reasons stated, the probability of finding an $\boldsymbol{e_u}$ would seem near zero.

For those who still question the status of the NEC theory as a scientific theory, an analogy may prove helpful. The theory (or hypothesis) of common descent states that all living organisms are descendants of a single ancestor.[7] Biologist T. Ryan Gregory (2008) states:

> … no reliable observation has ever been found to contradict the general notion of common descent. It should come as no surprise, then, that the scientific community at large has accepted evolutionary descent as a historical reality since Darwin's time and considers it among the most reliably established and fundamentally important facts in all of science. (p. 49)

[7] The first article to be quoted on the concept of common descent considers it a hypothesis, the second a theory.

Paul A M. van Dongen and Jo M. H. Vossen (1984), scholars in comparative and physiological psychology, state:

> The theory of common descent permits a large number of predictions of new results that would be improbable without evolution. For instance, … (b) the observed order in fossils of new species discovered since Darwin's time could be predicted from the theory of common descent …. Such observations can be regarded as attempts to falsify the theory of common descent. We conclude that the theory of common descent is an easily-falsifiable & often-tested & still-not-falsified theory, which is the strongest predicate a theory in an empirical science can obtain. (p. 35)

Now suppose a fossil was found (i.e., observed) that precisely matched an existing creature. If this fossil was dated before or close to the time at which life is thought to have begun on earth (and the closer, the bigger the problem), then prediction b above and the theory of common descent would be falsified (as well as evolutionary theory, at least in one case). Is finding such a fossil with respect to the theory of common descent like finding an m_u and $\boldsymbol{e_u}$ with respect to the falsification of the NEC theory? To this author at least, finding this fossil would be just as shocking and invalidating as finding a conscious signal given to humans at or very close to brain death that they have died.

Conclusion: A Summary of NEC Terms and Their Relationships

A summary of the terms associated with the NEC theory and the relationships among them is given by the class diagram in Figure 2. The class diagram is often used as an analysis and modeling tool in computer science and software engineering in developing computer systems. Its purpose is to clarify the precise types of objects (i.e., entities or things) that pertain to a particular system (e.g., an accounting system) along with the terms used to describe them and the relationships among them. Some of these objects must often be stored in a computer database. In analyzing and explaining the NEC theory, the class diagram can serve to clarify the types of objects, here conceptual objects, that are relevant to understanding the human mind and NEC, the mind being a "system" operating in the brain. As such, the class diagram in Figure 2 can be considered an add-on to the lifetime-in-eternity model.

The diagram applies to one person. In this context, there can only be one NEC, natural afterlife, and etna. The caption for the figure gives a general description of the meanings of the rectangles and connecting lines in the class diagram. Rather than repeat these here, the diagram will simply be "read" as intended to convey these meanings, starting at the rectangle in the upper-left corner.

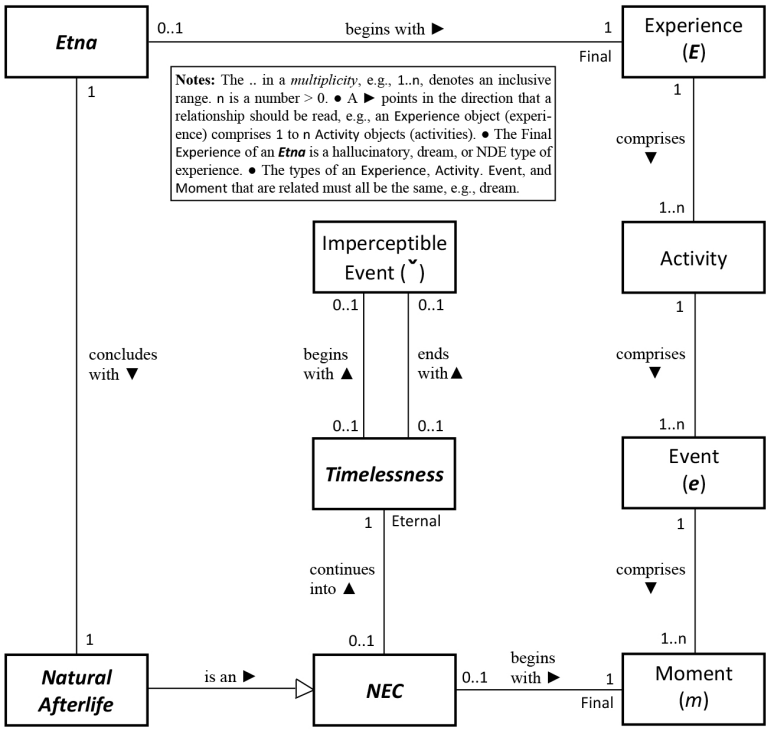

Figure 2: A class diagram that shows the relationships among terms associated with the NEC theory. A rectangle represents a class of objects, i.e., entities or things, all of the same type. The term given in the rectangle is the name of the class, which describes the type of object. A line connecting two classes represents the relationship between the classes, i.e., between the objects of each class. The labels and notations given on the line describe the type of relationship. Here, all classes and relationships are described in the context of one individual.

To begin the reading, an object of the class (i.e., type) ***Etna*** (an etna) "begins with" one (1) object of the class (i.e., type) Experience (an experience). In this relationship, this experience plays the role of the person's Final experience. Thus "Final" is a *role name* in the class diagram. The name of each class in the diagram corresponds to the same term used in the NEC notation (e.g., ***Etna***) or is a descriptive term (e.g., Experience) where a corresponding term or symbol used in the NEC notation (e.g., ***E***) is given in parenthesis. The terms given in bold are defined by railroad diagrams in the notation. An exception is ***Timelessness***, which represents a period of *Timelessness* or *Timelessness* either proceeded by the *Before-life* or followed by the *After-life*.

An experience (***E***) can be of the type awake, dream, or NDE, where an awake experience can include real, imaginary, or hallucinatory events. These types are

not made explicit in the class diagram. (In the NEC notation, given in Table 1, the type of an experience is implicit by the type of events that occur within it.)

A relationship is meant to be read in the direction of the readability indicator, i.e., the arrowhead (►). It can also be read in the reverse direction provided one makes the proper grammatical change to the relationship description. For example, an experience, as the Final experience, "begins" zero to one (0..1) etnas. The .. generally denotes an inclusive minimum to maximum range, but when the two numbers in the range differ by only 1, the .. is often read as "or" as in zero or one. The 0 denotes that an experience may not "begin" an etna.

To read the other ***Etna*** relationship, an etna "concludes with" one (1) ***Natural Afterlife***. Reading this relationship in the reverse direction: a natural afterlife "concludes" one (1) etna.

A natural afterlife "is an" ***NEC***. The open arrowhead at the ***NEC*** end denotes the special "is a" type of relationship. Thus here, the "is an" description is redundant. The relationship is special because, unlike other relationships, the natural afterlife and NEC are not two different objects being related, but the same object. The direction of the arrowhead indicates that while a natural afterlife is an NEC, an NEC is not necessarily a natural afterlife.

The NEC "begins with" one (1) Moment (*m*), an individual's Final. Reading the relationship in reverse, not every moment "begins" an NEC, thus the 0..1.

An NEC "continues into" one period of ***Timelessness***. It is Eternal, because, with death, it continues into the *After-life*. A period of ***Timelessness*** "begins with" zero or one (0..1) imperceptible event (ˇ) [e.g., "fall asleep"], and "ends with" zero or one imperceptible event (e.g., "wake up"). The 0.. is needed for both relationships only because the ***Timelessness*** that starts with the *Before-life* isn't assumed to begin with an impreceptible event and the one that ends with the *After-life* isn't assumed to end with one.

To go back to Experience, an experience "comprises" one to many (1..n) activities. n represents an unlimited number and is usually read as "many" or "more." Activities are not part of the NEC notation. An activity "comprises" one or more events, and thus by transitivity, an experience comprises one or more events (as is denoted in the NEC notation). Here, an Event (***e***) is a *perceived* event. A perceived event comprises one or more conscious moments (*m*s).

Now to finish the reading with some backtracking and to finally conclude this article: in reverse, starting at Moment, one moment, but only the Final one of a lifetime, "begins" (the reverse of "begins with") an NEC. The NEC "may be" a natural afterlife. If so, this afterlife "concludes" (the reverse of "concludes with") an etna. According to the NEC theory, this is reality. How one deals with this psychological, illusional reality is a subject for philosophy and religion.

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