

# Review of: "Thought Experiment: from Phenomenology to Transcendental Meditation and Dream about the Meaning of Time"

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Potential competing interests: No potential competing interests to declare.

The reviewed article is very extensive. The author proposes the use of a very unusual methodology, which is already announced in the title. To avoid getting lost, it is worth **quoting the entire abstract of the work**. The author writes:

"This research paper explores the concept of time through introspective meditation and dream analysis, based on the philosophical approach of phenomenology of perception. The author engages in a mental experiment to reflect on the meaning of time and its different perceptions. The study involves, as participant, the author himself, who explores time subjectively and objectively, comparing it with clock measurements. Through conscious introspection and dream analysis, the research reveals that time appears to be relative during meditation and dreaming, slowing down compared to objective clock time. The findings highlight the complex and interconnected nature of time perception in human consciousness".

To situate such an intention in the context of contemporary established understandings about the nature of time, I propose the following approach to the readers of my review. Specifically, I suggest first listening to two lectures by theoretical physicist Sabine Hossenfelder:

## Is Time Real?

<https://www.youtube.com/watch?v=PdL8CudJTcs>

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## Does the Past Still Exist?

<https://www.youtube.com/watch?v=GwzN5YwMzv0&t=82s>

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## *The summary of the first of these lectures is as follows:*

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The lecture discusses the complex nature of time, initially describing it as a dimension according to Albert Einstein's theories of special and general relativity. In these theories, time is similar to the three dimensions of space but is distinct because one cannot stand still in time. Changes in velocity are described as "boosts," which affect both your position in time and space.

Time dilation, a phenomenon where time passes more slowly when an object moves relative to a stationary observer, is confirmed by empirical measurements using clocks. Clocks, in this context, are devices that count how often a system returns to a similar configuration (e.g., Earth's orbit around the Sun or a pendulum's oscillation).

The lecture also delves into debates among physicists about whether time is "real." According to the video, something is considered "real" in scientific terms if it's a necessary component of a theory that correctly describes observations. By this definition, time is "real" because it is essential for Einstein's general relativity to make accurate predictions.

However, the lecture notes that general relativity has limitations, including incompatibility with quantum theory. These limitations have led to speculation that time may not be a fundamental component in a future theory of quantum gravity or even a "Theory of Everything." In these prospective theories, time might only be an approximate, emergent concept.

Alternative theories suggest that time might not be fundamental at all. For instance, Julian Barber has argued that we don't need time as a dimension; instead, we can describe the universe solely in terms of relations between configurations of matter in space. Other ideas posit that our universe may be part of a network or hypergraph, in which what we perceive as time is just an approximation of more fundamental, regular structures within the network.

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### **The summary of the second lecture:**

#### **Does the Past Still Exist?**

<https://www.youtube.com/watch?v=GwzN5YwMzv0&t=82s>

is as follows:

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The lecture explores the concept of time, contrasting our everyday perception of it with what physics, particularly Einstein's theory of special relativity, tells us. The speaker introduces the idea of time as a dimension, building upon earlier work by Herman Minkowski who integrated time into a four-dimensional space-time.

According to Einstein's special relativity, the notion of "now" is not universal but observer-dependent, meaning that what one observer considers happening "now" might not be the same for another observer in relative motion. This principle is derived from four assumptions, including that the speed of light is constant and that all observers' viewpoints are equally valid.

The concept of "observer-dependent now" is demonstrated through thought experiments, such as Einstein's "dumb experiment," where you measure "now" by bouncing photons off mirrors. An observer moving relative to you, like Alice in a spaceship, would have a different notion of "now" due to her motion, validating Einstein's fourth assumption that all observers' viewpoints are equally valid.

From this foundation, the lecture introduces the concept of the "block universe," where all events, past, present, and future, exist simultaneously in a four-dimensional space-time. This model is a natural extension of Einstein's theory and challenges our everyday understanding of time as something that flows or changes.

The lecture briefly touches on how quantum mechanics doesn't fundamentally alter this view. It concludes by noting that the understanding of time in physics can lead to philosophically unsettling ideas like the block universe, but these are well-supported by current scientific understanding.

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**Based on these basic data about what contemporary physicists think about the nature of time, let us now ask what a phenomenological approach contributes to these considerations:**

So, Edmund Husserl in his work "On the Phenomenology of the Consciousness of Internal Time" (1893-1917) delves into how we experience and conceptualize time. Key points include:

**Retention and Protention:** Husserl introduces the idea of "retention" and "protention" as crucial components of time consciousness. Retention refers to a kind of 'immediate memory' that allows us to perceive a melody, rather than a series of isolated notes. Protention is the corresponding anticipation of future moments.

**Flow of Consciousness:** For Husserl, time is not a 'line' but rather a 'flow,' a continuous stream of experience in which past, present, and future moments are intricately connected.

**Intentionality:** Like all phenomenological experiences, time consciousness for Husserl is intentional, meaning it is always consciousness 'of something.' Even the passage of time is something that we direct our awareness towards.

**Internal Time vs. Objective Time:** Husserl differentiates between the internal time consciousness and 'objective' or 'cosmic' time (e.g., clock time). The former is the way we subjectively experience the passage of time, while the latter is an external measurement.

**Phenomenological Reduction:** Husserl uses phenomenological reduction to analyze time consciousness, suspending judgments about the external world to focus purely on the structure of internal experience.

Husserl's thoughts have had a significant impact on both philosophy and psychology, serving as a foundation for further inquiries into the nature of time and human consciousness.

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**It happens that in the past I have pondered Husserl's concepts in light of findings in the field of neuroscience!**

In my work, [ **Brodziak A. *Loss of understanding of own situation in time and space or how the human brain loads the autobiography.***] published unfortunately only in Polish {Młody Technik, 1989,2, 22-27}, I drew attention to the fact that the aforementioned phenomenon of "retention" can be explained with concepts from the field of neuroscience.

In the cited work, I wrote that phenomenologists rightly focused on the fact that when perceiving a melody, we can only recognize it at a certain point in time after hearing the next tone, completing a certain fragment of the melody motif. At this point, while "somehow still" remembering the previous tones, we combine them with the currently heard ones into a whole, constituting a familiar melody. This co-participation of memory in the perception of a phenomenon is called "retention" by phenomenologists, as opposed to "reproduction" (otherwise known as "secondary remembrance"). The

occurrence of this "retention" is easily explained by the existence and operation of cortico-hippocampal loops, that is, the existence of connections from the side of the hippocampus, which constitute elements of the working memory system. According to our model of perception, indeed, each unit perception, implemented by the hierarchical structure of the integrator, is accompanied by cyclical additional activation from these cortico-hippocampal loops. An "imaginary substrate" is somewhat attached to the perception, sustaining the image accepted a moment ago. However, this "sustaining" becomes weaker with each cycle and slowly fades away.

The slow fading of the imaginatively sustained image, which was perceived a moment ago, allows for distinguishing past tones of a melody from tones perceived at more distant moments in time (more past). Cyclical stimulation of a certain neuron by a cortico-hippocampal loop adds to the primary perception an image (that "retention"), which then slowly fades away, allowing not only for time-counting but also for arranging phenomena in time by sequencing them, for example, a sequence of tones forming a melody.

This imaginative sustaining (retention) of a certain perception, like the "tail of a comet" attached to the "head" of the current perception, as Husserl says, is therefore extremely important for understanding current perceptions, and therefore for understanding upcoming current perceptions. The image is therefore an essential substrate of reasonable perception and always accompanies it.

Therefore, time-counting accompanies not only the perception of time-space objects but also the ordering of sequences of such time -space objects.

What's more, we can imagine time-space objects as well as sequences of time-space objects (melodies), for example, by invoking them from memory through associations after sentences in natural language, such as "Strauss waltz", "Beethoven's Fifth Symphony".

The imagination of a "sequence of time-space objects" (in the terminology of E. Husserl, the so-called "Immanent Temporal Object") allows for the reconstruction of temporal occurrences on a different time scale, although with the preservation of appropriate durations. Such imagination, although it concerns something that occurred in the distant past, begins with the tone (image) of the first given sequence and in an orderly manner proceeds through other elements of the series.

It is possible to imagine "events that have occurred in time" on another "more dense time scale." The densification of the time scale cannot exceed a certain minimum, in other words, thought processes can be superficial and run quickly but cannot, however, take no time at all.

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After this introduction, I will quote the conclusions formulated by the author of the reviewed work. Mr. Jose Luis Garcia Vigil from Universidad Nacional Autónoma de México.

writes as follows:

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## Conclusions formulated by the author of the reviewed article

Time is relative when I perceive it and think conceptually in my internal monologue.

Time is objective when I perceive it, think conceptually and see it go by on the clock.

Time exists when my consciousness quantifies it and it ceases to exist if I don't see it go by on a clock.

Transcendental meditation through introspection slows down time; judging by the relative sensation in its duration and the objective duration quantified on the digital clock.

Sleep and reverie turn relative time into both perception within dreams and the sensation of duration upon awakening; and time becomes slow when compared to the objective time of the digital clock.

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**In summary**, considering the intuitively understandable arguments about the nature of time and taking into account the concepts of subjective time proposed by E. Husserl, it can be stated that the work of Mr. Jose Luis Garcia Vigil develops and expands precisely the findings related to this subjective time. It is a novelty, a contribution by the author, that in his considerations he broadens observations concerning the influence of meditation and dreams on the perception of this subjective time.

I believe this poses a challenge to neuroscientists to determine what neurophysiological mechanisms implement the modifications of subjective time perception described by Jose Luis Garcia Vigil.

I think that the reviewed work constitutes a significant, positive contribution to the understanding of the perception and manipulation on perceptions of the subjective time.

Andrzej Brodziak