**A theoretical outline of consciousness (TOC): New perspectives**

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**Abstract**

The theoretical outline of consciousness (TOC) offers guidelines as to how a theory of consciousness may be developed. The theory to be developed must be based on the following: The information received by the individual first undergoes a very fast and nonconscious processing. Some of the end results of this processing are further processed by the consciousness system, which produce the individual’s response. The consciousness system consists of two mechanisms. One mechanism creates consciousness and induces it on any mental state that fulfils a certain condition (the second mechanism) that allows the transition from a nonconscious mental state to a conscious one. Consciousness itself is portrayed by the following new properties: it is general, it is not measurable, it provides meaningfulness, it is conceived as force field, and information is first processed unconsciously. This paper discusses these qualities and presents arguments and empirical observations in support of them.

**Keywords:** Consciousness, unconsciousness, neurophysiological processes, measurement, meaningfulness.

**A theoretical outline of consciousness (TOC): New perspectives**

In recent decades, there has been a dramatic increase in theoretical and empirical research in consciousness (CΨ) that has attempted to explain or solve the problems of CΨ (e.g., Brown et al. 2019; Gennaro, 2012, 2023a; Jones & Hunt, 2023; Seth & Bayne, 2022; Van Gulick, 2022). Most researchers have rejected the solutions suggested thus far, and as a result these problems continue to trouble the scientific community (e.g., Carruthers & Gennaro, 2020; Rakover, 2018, 2021; Uttal, 2005). Huge efforts have been made to explain how neurophysiological processes in the brain bring about CΨ, but these attempts have failed to offer satisfactory explanations of the classical mind-body problem: the relationship between CΨ and the brain (e.g., Gennaro, 2023a; Jones & Hunt, 2023; Rakover, 2018, 2021; Seth & Bayne, 2022; Uttal, 2005; Van Gulick, 1995, 2022). In other words, researchers have not yet succeeded in developing a theory that solves the “hard problem” (Chalmers, 1996), that explains “phenomenal consciousness” (Block, 1995), or that bridges the “explanatory gap” (Levine, 1983). That is, there is still no theoretical explanation of how the brain produces CΨ.

 The purpose of the current article is to offer a number of relatively new points of view on the concept of CΨ that may lead to a change in its theoretical understanding and perhaps also aid in the development of a theory of CΨ. Here I will offer a general functional outline for a theory of consciousness: the TOC.

The concept of CΨ is a controversial one (e.g., Gennaro, 2004; Van Gulick, 2022). Nevertheless, I do not believe that I would be wrong to say that most researchers accept the following description of the phenomenon of CΨ. It is conceived of as a unique subjective experience of a person, who perceives a stimulus in the external world, or in his or her internal world. This portrayal is consistent with Nagel’s (1974) famous “what it is like” approach, as well as other views such as that of Gennaro (2012), who follows Nagel. Similarly, Chalmers (1996) has distinguished between the hard and the easy problems. Accordingly, the hard problem of CΨ concerns how humans’ [phenomenal](https://en.wikipedia.org/wiki/Consciousness#Types_of_consciousness) experiences is generated by the brain, where [phenomenal](https://en.wikipedia.org/wiki/Consciousness#Types_of_consciousness) experiences are conceived of as in Nagel’s conception of CΨ—a problem that avoids explanation. This stands in contrast with the easy problems relating to behaviors such as the discrimination and integration of information, which can be explained by specifying the processes that execute them. Given the above, I shall now suggest several relatively new views of CΨ, which may lead to a better understanding of this concept.

**New perspectives on consciousness**

I this section, I wish to emphasize the following, relatively novel, qualities of CΨ:

1. *Generality*: CΨ is not connected to anything specific; not to any particular stimuli or responses.
2. *Measurement*: CΨ has no natural units of measurement, as there are for distance, weight, stimulus, and response.
3. *Meaningfulness*: CΨ is the process that gives meaning to stimuli in the world.
4. *Force field*: An interesting analogy for CΨ is the following: CΨ is similar to a force field (e.g., an electromagnetic one), because CΨ is induced on many mental states (representations) which have fulfilled a particular predetermined condition.
5. *Unconscious states*: A relatively small portion of mental states is induced with CΨ, while the rest of them will not be in a state of CΨ.

I will now justify and elaborate each of these five points.

(1) *Generality*. Consciousness is not related specifically to any particular idea, thought, object, stimulus, or response. The individual is aware of what he or she perceives, of what is happening in his or her external and internal worlds. As we will see later, CΨ is induced on every mental state, every mental representation, which meets a certain condition that enables the transition from unconsciousness to CΨ.

 Furthermore, given the generality of CΨ, one may propose that there is no correlation between intelligence and consciousness. For example, one may not suggest that intelligence increases as a function of an increase in consciousness. Why? Because a highly educated person and an ignorant one have a similar level of CΨ when they wake up in the morning.

(2) *Measurement*. The empirical measurement of “distance” has all the mathematical properties of this theoretical concept. Therefore everything that is said theoretically about distance is precisely empirically measured. For example, if the theoretical prediction is that a rifle bullet will fly 100 meters in a given amount of time, then the empirical measurement will show that this bullet has indeed flown exactly 100 meters in that time. The theoretical units of measurement (meters) are the same as the empirical units of measurement (meters). This state of affairs does not hold for CΨ. For CΨ, units of measurement have not yet been found. Furthermore, while responses (or stimuli) can be indexed objectively (e.g., number of correct responses, reaction time), so far CΨ cannot be measured in this way either. Even the concepts of reaction time and verbal reports are problematic as indexes of CΨ, since they do not reflect it exactly. Reaction time, which functions as an index for the duration of a conscious cognitive process, is not reliable because, among other things, it is very difficult to distinguish between conscious and nonconscious processes with this index. Verbal reports are not guaranteed to reflect precisely one’s inner world, the content of CΨ. For example, verbal reports cannot exactly describe a visual image, and CΨ is often influenced by the reporter’s desires.

Humans are in a state of CΨ regarding hundreds of thousands of stimuli, reactions, thoughts, and feelings. In many cases, while the stimulus and response can be measured (e.g., light intensity, speed of response), it is not possible to measure the CΨ of these concepts. The individual may say that the light is blinding, but he or she may find it hard to separate their perception of the light as blinding from the CΨ itself, their awareness of the intensity of the light. Given this state of affairs, it is no wonder that measurements in psychology do not relate to CΨ itself. These measurements are devoid of any element of CΨ. Consciousness is stripped away from them. For example, when one measures the number of correct responses (by pressing the appropriate key), this measurement does not express the subjective conscious feeling of the individual, but rather records a motor movement (or a verbal report): the pressing of one key or the other.

From this point of view, the big question of how the neurophysiology of the brain produces CΨ can be formulated slightly differently. The new question is the following: How can one relate an objectively measurable phenomenon (the brain processes) to a phenomenon (CΨ) that cannot be measured directly? It is worth emphasizing that in the sciences we deal with the relation between two phenomena only when both of them can be measured. A theory regarding the creation of a new phenomenon by other phenomena is constructed when all these phenomena are objectively measurable. For example, there is no problem in measuring the properties of the gases oxygen and hydrogen and the properties of one of their products, such as water.

(3) *Meaningfulness*. Rakover (2021a,b) suggests that CΨ is a necessary condition for understanding and meaning in life. Rakover (2021b) proposes that without CΨ an individual does not even understand his or her own actions. One can build a robot that will teach some students classical physics in the most efficient way, so that even the worst of these students may pass a physics exam with a very high score. However, while this student does understand at a high level what he or she has learned, the robot itself does not understand what it teaches, the questions of its students, or its own answers. All it does is to respond to a certain symbol-question with the best symbol-answer that is stored somewhere in its mechanical memory.

 Rakover (2021a) suggests that CΨ endows life-meaning to mental representations. He distinguishes between two types of meaning: innate and acquired life-meaning. Innate meaning is related to the perception of sensory stimuli, such as sight, hearing, feeling, pleasure, pain, and fear. When a person sees, for example, a landscape, he or she is in a state of CΨ of the landscape, including the innate feeling of being alive: an inherent feeling of aliveness. I call this the “aliveness-feel”. Consciousness is a necessary and sufficient condition for the aliveness-feel. Without CΨ, not only is one unable to stand on one’s feet, but the feeling of being alive disappears. And when one is in a state of CΨ, one is in a state of aliveness-feel. The basic argument is that perceiving sensory stimuli consciously gives an individual a sense of being alive, an aliveness-feel, which is natural and inborn. (However, note that a person does not say to himself constantly “How wonderful, I am alive”, just as he does not say to himself constantly, “How wonderful, I am breathing air”.)

 Acquired life-meaning refers to the customs, values, traditions, and norms that society transfers to its members. Ordinary meaning is related to all the usual forms of conduct that each member of a society must learn in order to function well in it. Extreme meaning is related to extreme forms of conduct that are imparted to an individual from an early age in special emotional rituals, as in the instillation of religious, social, and political doctrines.

 While sensory perception gives an individual the basic meaning of life—the aliveness-feel, being alive—acquired meaning offers the individual a way of life that they have to follow in order to be integrated well into the society to which they belong.

Consciousness gives meaning not only to life and understanding, but also to all the stimuli in the world. For example, the red anemone is not just an object like other objects in the world, but is something that carries meanings: it has a real existence in the world with certain meaningful properties. It has a particular shape, color, function, and above all, it is something genuine in one’s world.

(4) *Force field*. The properties of CΨ, as described above in *Generality* and *Meaningfulness*, suggest that CΨ may be seen in analogy to a certain force field. In this way, one can understand why CΨ is not related to any specific phenomenon, and that CΨ induces meanings and understanding on certain mental states. Accordingly, I adopt the metaphor of CΨ as a force field, similar to an electromagnetic field (e.g., Jones & Hunt, 2023; Van Gulick, 2022, subsection 2.3). However, it should be emphasized here that I do not accept that any electromagnetic theory provides a successful explanation of CΨ (for critique see, e.g., Jones & Hunt, 2023; Uttal, 2005).

 (5) *Unconscious states*. For the sake of simplicity, I will indicate the relationship between the “stimulus” and the appropriate “explanatory mechanism”, and the corresponding “response” by the “SmR” unit. A SmR unit suggests that the occurrence of a particular response can be predicted or explained by the appropriate stimulus and explanatory mechanism. The use of the SmR unit makes it possible to distinguish among the parts of which the individual is aware or unaware. As we will see, the distinction between the concepts of a certain behavioral unit’s being conscious and its being unconscious is too simplistic. Here is why. (a) There are SmR units that the individual is completely unaware of: neither the stimulus, nor the mechanism, nor the response. (b) There are units such that the individual is aware of the stimulus and the response, but not of the mechanism. (c) There are SmR units such that the individual is aware only of the response or only of the stimulus. Given this proposal, one may suggest that for most SmR units, the neurophysiological cognitive mechanism does not reach CΨ. (In some cases, the individual is aware of the reason for his action; for example, his desire to achieve a certain goal. However, even in these cases, the individual is not aware of the mechanism that carry out the will.) The appropriate mechanism is to be discovered by careful research. Thus one may conclude that while a lack of awareness of SmR can be complete, the awareness of SmR is only partial. Here are some examples (for discussion, see Blackmore, 2013; Hassin, 2013): (a) SmR units of which one is unaware: many neurophysiological processes that occur in one’s brain and organism are permanently outside CΨ. (b) SmR units such that one is aware of the stimulus and the response and sometimes the mental reason: In most cases in daily life an individual is aware of the stimulus and response but not of the appropriate mechanism. For example, when a driver approaches a red traffic light (the stimulus), he or she brakes their vehicle in response, in order to avoid collision. When a person enters a restaurant, he or she checks the menu (the stimulus) and orders a meal in response, in order to satisfy his or her hunger. (c) SmR units such that one is aware only of the response or only of the stimulus: In many cases of allergic reactions, such as sneezing, the individual is aware of the reaction but not of the stimulus, nor of the appropriate mechanism. In many experiments where, for example, “subliminal cues” are used, the participant is not aware of the stimulus or the corresponding mechanism, but he or she is aware of the response (which he or she has to perform according to the experimental instructions). In these experiments, participants are presented with a “below-the-threshold” stimulus that is not perceived consciously, and the experimenter examines the effects of that subliminal stimuli on several cognitive functions such as perception, goals, reasoning, and decision-making—functions that have generally been considered to be under the control of CΨ (e.g., Goldstein & Hassin, 2017; Hassin, 2013). In many cases, the individual perceives very well the situation which he or she is in (such as an extremely difficult exam, or a complicated chess game), but does not know what to do. Sometimes the individual is in a highly emotional situation and is not aware of what he or she is doing.

 Given the above, the following question arises: What is the difference between a state of CΨ and an unconsciousness (unCΨ) state? The professional literature has uncovered a number of functions that characterize CΨ and not unCΨ. However, it turns out that a large portion of these functions can be done unconsciously. (The research supporting the claim that unconscious processes can do what conscious processes are capable of doing—let’s call it “unCΨ as CΨ”—has sparked a heated debate that I cannot discuss here. See, e.g., Goldstein & Hassin, 2017; Hassin, 2013; Hesselman & Moore, 2015.) Given this, it seems to me that the fundamental difference between these two types of processes (CΨ and unCΨ) is rooted in the fact that CΨ is linked to the feeling of “being alive”, to the “aliveness-feel”, and to the meanings granted to stimuli in the world (see (3) *meaningfulness*, above).

In addition to the above point about meaningfulness, one may propose the following. An important difference between conscious and subconscious processes may lie in survival. It is highly beneficial that most of the SmR units do not enter CΨ. For if they did, these units would only lower dramatically one’s chances of survival. In this case, the CΨ of these SmR units would only interfere with the individual’s adaptation to the environment. For example, awareness of all the chemical reactions involved in digestion would clearly weaken one’s chances of adapting well to one’s environment. Furthermore, given the assumption that CΨ is essential for survival, a person who has lost CΨ, not only cannot stand on his or her feet, but their entire condition would be similar to that of a plant. Almost all of the functions of such a person are blocked and physicians must go to great lengths to restore his or her CΨ—to bring the person back to life.

Given this approach, how can one understand Hassin’s (2013) idea that unconscious processes function as conscious ones (“unCΨ as CΨ”)? This seems to be overstated. On the one hand, all the information received by the senses undergoes a complicated and very fast nonconscious processing, after which a part of this information enters a state of CΨ. For example, in vision, the absorption of electromagnetic radiation goes through several stages until the individual consciously perceives the visual stimulus that reflects as accurately as possible the actual stimulus. (Very briefly, the light causes a biological process in the nerves, electrical impulses, which are transferred to the cerebral cortex at the back of the head, where the processing continues in additional stages until the visual experience is created.) On the other hand, as mentioned above, in some cases the individual is not aware of all the components of the SmR unit. In the experiment with subliminal cues, the individual is aware of the response he has to perform according to the experimental instructions, although he is not aware of the subliminal stimulus. Given this, it is assumed that it is possible to learn from the results of the effect of this stimulus on the structure of the subconscious information processing that occurs in the brain. However, here the following question is raised: To what extent does awareness of the experimental instructions, which tell the participant what to do, influence the unconscious processing of the information? For example, I believe that the neurophysiological system in the brain of a person who prepares for danger, and inhibits their fear, functions differently from the functioning of the brain system of a person who is overwhelmed by an uncontrollable horror. (For the impact of threats and shock on certain brain processes, see Huang, Wu, Sun and Qi, 2023.)

Furthermore, awareness of the experimental procedure and the required response are information without which the experiment cannot be performed. On the basis of this example, one may make the following generalization: consciousness allows an individual to orient themself in the environment and prepare a potential reaction that is to be made in the near future. Thus one may go on to propose that CΨ is needed for adaptation. Why? Because it is difficult to prepare ready-made responses for all the possible stimuli and situations that may appear in a rapidly changing environment. It is much more effective to allow an individual to adapt to the multifaceted reality with the aid of CΨ. In other words, it is difficult to see how someone with a mechanistic, automatic system, without CΨ, could adapt to their changing environment and survive in it. A machine simply cannot understand the relationship between itself and all the environmental varieties. Rakover (2021b) suggests that CΨ is a necessary condition for understanding. That is, without CΨ an individual has no chance of understanding anything, neither the world nor their own actions.

As can be seen from the above discussion, I do not accept the “unCΨ as CΨ” approach, despite the following. All the stimuli absorbed by the individual’s sensory systems go through several stages of unconscious information processing. A portion of the end results of this processing enter a state of CΨ and the individual receives a vivid impression of his or her environment. In special cases, as in the experiments with subliminal stimuli, it is possible to probe the subconscious processes and learn something about their nature. Given this, one may propose that both processes— conscious and the subconscious—have great importance for the person’s being alive, aliveness-feel, and ability to adapt to their changing environment.

**A theoretical outline of consciousness (TOC): A proposal for unconscious followed by conscious processes**

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Insert Figure 1 here

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Figure 1 describes the TOC with a simple functional diagram of boxes and arrows showing the stages of the information processing of a stimulus received by an individual (for example, via their visual system). In the initial stage, subconscious mechanisms process the information. Then the unconsciously processed end result is transferred to conscious processes that produce the proper response. (Note that, for the sake of simplicity, this diagram does not describe all the mechanisms and interactions involved in processing the stimuli. Rather it highlights a number of processes that are important for the goal of this article.) The purpose of Figure 1 is to highlight two important features that emerge from the discussion so far.

First, the research indicates that a stimulus received by the sensory system undergoes multistage unconscious information processing. For example, Davies (2008, p. 1) writes: “It is a central idea in cognitive science that there can be unconscious information processing. It is also plausible that there can be unconscious thought and unconscious emotions …”. And Libet (1982) proposed on the basis of neurophysiological research into the brain that about half a second of unconscious appropriate neural processing is needed for reaching CΨ (for discussion, see Blackmore, 2013). Since the above diagram depicts the flow of information from left to right, the system that handles nonconscious processing appears on the left side of the diagram. On the right side appears the system that handles conscious information processing (the end result of nonconscious processing).

 Secondly, each system includes two important mechanisms. The nonconscious information processing system includes the mechanism for processing the stimulus, which has been received by the sensory (visual) system; and a mechanism of alertness: the unconscious mechanism that prepares the processes involved in generating a potential response. The specific response has not yet been determined (except for cases with reflexive and instinctive responses), since it depends on the individual’s conscious decision (in the experiment, for example, it is based on the instructions given to the participant). The alert state created in the brain is analogous to the alert state of a military patrol squad during wartime. The soldiers do not know if they will be attacked, or where and when an attack may occur. All they can do is maintain a high alert, as they say: keep their eyes open for any possible trouble. (Note again that the above diagram does not suggest the relationship between these two mechanisms and only indicates that the end results of the nonconscious systems are transferred to the conscious system.)

The conscious information processing system includes two important mechanisms related to the endowment of CΨ on mental states. (This idea is based on Rakover (in preparation).) The first mechanism fulfills two fundamental functions: it creates CΨ and induces it on mental states. The second mechanism is a condition that determines on which mental state CΨ will be induced. Without this condition, the individual’s mind may be flooded with conscious information—a situation that will harm his ability to survive. Consciousness is conceived here metaphorically, as a force field, analogous to an electromagnetic field (see (4) *force field*, above). (Note again that the diagram does not suggest the relationship between these two processes and only indicates that a response is emitted at the end of the conscious processing.)

**Discussion**

Given the TOC, I will discuss here the following topics. The section “UnCΨ and CΨ” deals with certain relations between unconscious and conscious processing. “Consciousness and explanation” discusses the question of whether CΨ can be viewed as an explanatory concept. The section “Consequences and speculations” discusses several properties that CΨ may be attributed with.

*UnCΨ and CΨ*

The properties of the unconscious information processing system are discovered by conducting experiments, which are designed to reveal the structure of the operation of nonconscious processes. These experiments use subliminal cues, priming and masking, which are known methods for achieving this goal. Given their results, some have suggested the “unCΨ as CΨ” approach (see above).

Here I will briefly discuss Libet’s (1985) famous experiments, which are most relevant to examining the issue of nonconscious information processing. This discussion will support the principle that “unconscious processing occurs first”. Accordingly, every stimulus that is received by the individual’s sensory system undergoes unconscious information processing first, and only then, after that necessary condition is met, the processed stimulus, i.e., the end result of the information processing, may enter a state of CΨ.

Libet (1985) measured in human participants three important events related to the voluntary action of wrist flexion. (1) Action (A): the time of occurrence of a spontaneous voluntary wrist flexion. (2) Will (W): the time when the participant in the experiment felt a spontaneous will to flex their wrist. (3) Readiness Potential (RP): the time when RP is measured by Electroencephalography (EEG). Previous research showed that a voluntary action is preceded by RP—a specific neurophysiological activity in the brain. Libet discovered the following sequence of events: RP came first and after about 350 msec there appeared W, a conscious state that was followed by A after about 200 msec. He interpreted this discovery as follows:

This leads to the conclusion that cerebral initiation even of a spontaneous voluntary act of the hand studied here can and usually does begin *unconsciously.* … Put another way, the brain “decides” to initiate or, at least, to prepare to initiate the act before there is any reportable subjective awareness that such a decision has taken place. (Libet, 1985, p. 536)

Therefore it seems that unconscious processes, rather than any conscious one, determine our actions. If this interpretation is correct, then why do we need consciousness? What is it good for? These questions have troubled scientists and philosophers for decades (e.g., Brass, Furstenberg & Mele, 2019: Velmans, 1991). For example, Velmans (1991) has suggested that CΨ plays a minor role in the explanation of behavior. However, Rakover (1996) argues that although initially a stimulus is processed unconsciously, later it may enter CΨ and become effectual. From Velmans’ (1996) answer to Rakover’s (1996) criticism, it appears that while these two researchers agree that the processing of the stimulus is done first in a nonconscious manner, their disagreement revolves around the question of what the functions of CΨ are. While Velmans believes that from a third-person perspective CΨ has no effect on information processing, Rakover (1996) assumes that CΨ has an effect on human behavior, including information processing.

There are a number of researchers who believe that CΨ has an effect on behavior. For example, Libet (1985) himself has proposed that the individual can stop or veto the execution of the action during the short time between W and A (Brass et al. (2019) review several studies that can be interpreted as supporting Libet’s veto idea). Hare et al. (2009) suggests that self-control is related to a brain neurophysiological system that is different from the one related to goal planning. Unlike these authors, I submit that CΨ has a huge influence on behavior. First, CΨ is a necessary and sufficient condition for the feeling of being alive. It has the most important role in life: being alive, the aliveness-feel. If one loses CΨ, then one’s life is similar to that of a plant. And if CΨ is regained, the aliveness-feel is recovered.

Second, CΨ has an important role in one’s survival. The CΨ initiates, stops and monitors behavior in accordance with how the individual perceives themself in relation to their surroundings. For example, a gazelle’s behavior will change dramatically when it notices that a lioness is lurking in a thicket of bushes nearby to hunt for prey. And David’s behavior will change completely if he finds out that the woman he has fallen head over heels in love with enters the party he is at.

Given the above approach, one may understand Libet’s (1985) experimental results in the following way. Libet’s experiment can be seen as examining the relationship between the first and second stages of information processing, as sketched by the TOC. In the first stage a nonconscious process handles the stimulus and calls the reactive system to a level of alertness for any potential response whose choice will be determined by a conscious process in the second stage.

*Consciousness and explanation*

In view of the above discussion, the following question arises. Is CΨ necessary for providing a satisfactory explanation of behavior? In other words, is it possible to understand behavior without using CΨ as an explanatory factor?

A number of researchers have developed an approach that I shall call “consciousness-unnecessity”, which proposes that CΨ has little importance for the explanation of behavior (e.g. Bargh & Morsella, 2008; Dawkins, 1995;Dijksterhuis & Aarts, 2010; Flanagan, 1992; Nisbett & Wilson, 1977; Velmans, 1991; Wenger, 2003). By contrast, other researchers have developed an approach that I shall call “consciousness-necessity”, which proposes that CΨ is important for behavior explanation (e.g., Baars, 2002; Baumeister, 2008; Funder, 2009; Rakover, 1996; Weidemann, Satkunarajah & Lovibond, 2016). Here are two examples of the consciousness-unnecessity approach. Dawkins (1995)writes: “There is no prediction we can make that if the animal has consciousness it should do X but not conscious it should do Y” (p. 139). And Flanagan (1992)conceives of “conscious inessentialism” as “the view that for any intelligent activity *i* performed in any cognitive domain *d*, even if we do *i* consciously, *i* can in principle be done nonconsciously” (p. 129).

I cannot accept the consciousness-unnecessity approach. My reasons are as follows. I believe that this approach is based on the following “multifunctions argument”: Given that many mathematical functions can be fitted to any set of empirical observations, and given that these functions express different mechanistic theories (which do not use mental concepts such as will and belief) it follows that a mechanistic theory may be constructed for any set of psychological observations or behavior. Thus one does not need to use the concept of CΨ, which is complicated and undefined, and cannot be measured, to understand behavior satisfactorily. Another similar argument, the “redundant argument”, runs as follows: If one accepts that a mental state (MS) is identical to a neurophysiological state (NS), then one may propose that CΨ is explanatorily redundant, that it is not needed to explain behavior, simply because the complete explanatory job is done by the NSs (for discussion, see Robb & Heil, 2014; Yoo, 2015). I do not agree with these arguments: mental events and processes are essential for the explanation of behavior.

These arguments are based on a crucial hidden fact, which many researchers have overlooked: As mentioned briefly above, the behavior that is explained in psychology is stripped of CΨ. Psychological indexes (such as number of correct responses and reaction time) do not carry any subjective conscious meaning, and are in fact equal to a robot’s behavior. These indexes are based on public responses, on certain behavioral movements, e.g., pressing a specific key. Psychologists deal only with those behavioral properties that belong to the public domain. For example, one presses the right key for the correct response and the left key for the incorrect response, and the experimenter calculates the percentage of correct responses (the number of right presses divided by the number of all presses) among the participants in the experiment (see note 1). So if the behavior to be explained is devoid of any subjective conscious meaning, it is no wonder that the explanation is constructed mechanistically. However, in this case one does not account for an individual’s conscious meaningful behavior, but rather suggests an explanation for a zombie’s behavior. Thus one may propose that a computer that simulates David’s behavior cannot simulate his behavior exactly, since it cannot simulate his meaningful behavior—his behavior interwoven with CΨ—but only his public behavior—i.e., his behavior stripped of CΨ.

To illustrate the above point that a computer cannot simulate behavior completely, consider the following question: can a computer simulate originality (original, innovative creation or behavior)? If the answer is yes, then the computer’s behavior is not original or innovative—it is just an imitation. If the answer is no, then human behavior cannot be fully explained mechanistically. Given this, it follows that the consciousness-unnecessity approach cannot provide a full explanation of human behavior.

*Some consequences and speculations*

Based on the above, the present section discusses several properties that CΨ may be endowed with.

*Force field.* Consciousness functions like a force field (e.g., an electromagnetic field) that radiates the minimal level of energy required for operating certain systems in the brain, which control the individual’s activity. This speculation is supported by the following observations. First, when an animal (e.g., a human being) loses CΨ, it cannot even stand on its feet. That is, CΨ is a source of energy that is required for operating certain systems that keep an animal on its feet and allow it to function effectively in its environment. Second, the level of CΨ changes from high to low and vice versa. This change is reflected in different levels of alertness and mental sharpness. A reduction in vividness and CΨ-level is one reason for the need to sleep. Sleep restores the energy of many neurophysiological systems, and probably the CΨ system as well. It is well known that after sleep one’s level of alertness and mental sharpness is high. Furthermore, research on sleep and CΨ in humans has revealed a systematic correlation between certain brain activity and levels of CΨ. A similar correlation has also been found in animals (e.g., Hobson, 2005; Joiner, 2016; Nir, Massimini, Boly & Tononi, 2013).

 *Effects.* Since CΨ is conceived of as analogous to a force field, the question of how it is possible for a nonphysical process to affect a physical process finds its solution. The reason is that this conception of CΨ does not violate the principle of “causal closure”, which proposes that for every physical effect there must be a physical cause (e.g., Kim, 2011). Given this principle and the physicalist approach to CΨ, according to which CΨ is identical to a certain brain neurophysiological activity or a certain brain activity realizes CΨ, the following argument can be proposed. Assuming that (1) the human brain creates CΨ, and (2) a robotic brain, which is identical to the human brain, is created, one may conclude that the robot brain creates CΨ. This conclusion can be countered in the following way.

One may argue that assumption (2) is impossible even if we systematically replace every cell and synapse in a human brain with similar artificial components—made of silicon, for example—because these artificial components have properties that differ from the human brain’s components. (For other possible arguments that counter approaches such as identity theories, functionalism, and zombies, see Chalmers, 1996; Kim, 2011). In view of this, one may raise a specific argument, “specific physicalism”, which suggests that only the brains of humans (or monkeys, dogs, cats, etc.) can produce CΨ (for a similar idea see Davis, 2008; and Farrell, 1950). Thus an artificial brain that is functionally identical to a human brain, a robotic brain, cannot produce CΨ. This argument may be supported by the everyday observation that only these creatures (humans, monkeys etc.) are capable of producing other creatures (their sons and daughters), who also are endowed with CΨ.

**Conclusions**

The theoretical outline of consciousness (TOC) offers guidelines as to how a theory of CΨ may be developed. Here I will briefly summarize a number of ideas that are worth paying attention to when one is about to start developing a theory of CΨ. (Note that Jones (2016) discusses a large number of relations between brain processes and CΨ that, due to the brevity of this paper, I have not referred to.) This to-be-developed theory must be based on the idea that the information received by the individual first undergoes a very fast and nonconscious processing, including the arousal of a potential reaction. Some of the end results of this processing are further processed by the CΨ system, which results in the individual’s response. The CΨ system is based on two mechanisms (the structure of which I am unable to detail). One mechanism creates CΨ and induces it on any mental state that fulfils a certain condition (the second mechanism) that allows the transition from a nonconscious mental state to a conscious one.

A number of relatively new features characterize CΨ itself. First, consciousness is not related to any particular stimulus or response. It is granted to a huge number of stimuli and response representations. Second, CΨ is a crucial condition for understanding and meaningfulness. It gives meaning to stimuli in the world and provides the individual with meaning in life. An innate meaning arises together with the assimilation of sensory stimuli, and an acquired meaning of life gives the individual a way of life to follow in the society to which he or she belongs. Third, CΨ is conceived as analogous to a force field. What supports this analogy are the observations that the loss of CΨ blocks the operation of a large number of systems in the individual. Restoring a state of CΨ returns the individual to normal daily functioning. Consciousness, then, can be perceived as a force field (the structure of which I can’t specify either) that provides a certain minimum energy that serves as a trigger that activates various systems necessary for the individual’s normal functioning.

 According to the TOC, the main factor that prevents the development of a theory of CΨ is the fact that yet CΨ is not measurable. We do not know how to measure the conscious experience related, for example, to the perception of the color red. We can describe a red tomato or the color red itself as strong, weak, light, dark, etc., but we have no way to measure this subjective experience in the same way that we measure a distance or a movement made by an individual with their hand. It appears that scientific methodology is unable to handle CΨ, since this methodology is designed to discover certain relationships between measurable events. Let’s call this methodology the “measurability demand”.

This measurability demand is one possible answer to the following question: Why, until now, has no one been able to develop a theory of CΨ? In fact, there are several answers to this question. For example, McGinn (1989) has suggested that this problem is beyond the capacity of the human mind, and Rakover (2023) offers some alternative ideas. One of these ideas concerns the ramifications arising from the supposition that one day in the future such a theory will indeed be created. In this case, a large number of negative consequences and paradoxes will arise that will interfere with and prevent the development of a theory of CΨ.

In view of the above, let me conclude this article with the following idea. It seems to me that our human culture can be characterized as a culture where there is no understanding of CΨ; that is, we all live in a “Culture of CΨ incomprehension”. As Rakover (2023) has described it, if we succeeded in developing such a theory, then one could propose that our current culture would disappear, because the person as a private unique creature would disappear, and we would each be transformed from a private and unique being into a public being with no personal subjective inner world.

**Notes**

1. It is important to note that only recently, while reading a chapter by Davis (2008), I came to realize that Farrell (1950) described an observation similar to the one I describe in the present article (and in a previous one, Rakover, 2011/2012). I suggested that the behavior that is explained in psychology is stripped of CΨ; while Davis (2008, p. 11) quotes Farrell, who wrote about the behavior studied by psychologists, as saying that they “*leave something out*, namely, the experiences, sensations, and feelings that the subject is having” (p. 171). Despite the similarity of this observation, its use was different. While Farrell used this observation to support his behaviorist approach to CΨ, I use this observation to show why a mechanistic explanation of behavior is successful: because behavior is not intertwined with CΨ.

**Figure 1** depicts the flow of information from the stimulus (S) through the unconscious processing system to the conscious processing system, which produces the response (R).

**References**

Baars, B. J. (1988). *A cognitive theory of consciousness*. New York: Cambridge University Press.

Bargh, J. A. & Morsella, E. (2008). The unconscious mind. *Perspectives on Psychological Science*, 3, 73-79.

Baumeister, R. F. (2008). Free will in scientific psychology. *Perspectives on Psychological Science*, 3, 14-19.

Blackmore, S. (2013). *Consciousness: An introduction.* London; New York:

Routledge.

Block, N. (1995). How many concepts of consciousness? *Behavioral and Brain*

*Sciences,* 18, 272-284.

Brass, M., Furstenberg, A. & Mele, A. R. (2019). Why neuroscience does not

disprove free will. *Neuroscience and Biobehavioral Reviews*, 102, 251-263.

Brown, R., Lau, H. & LeDoux, J. E. (2019). Understanding the higher-order

approach to consciousness. *Trends in Cognitive Sciences*, 23, 754-768.

Carruthers, P. & Gennaro, R. (2020). Higher-order theories of consciousness. In

E. N. Zalta (ed.), *The Stanford Encyclopedia of Philosophy*, URL = <https://plato.stanford.edu/archives/fall2020/entries/consciousness-higher/>.

Chalmers, D. (1996). *The conscious mind: In search of a fundamental*

*theory*. Oxford: [Oxford University Press](https://www.wikiwand.com/he/Oxford_University_Press).

Davis, M. (2008). Consciousness and explanation. In L. Weiskrantz & M. Davis

(Eds.), *Frontiers of consciousness: Chichele Lectures*. Oxford: Oxford University press.

Dawkins, M. S. (1995). *Unravelling Animal Behavior (2nd ed.)*. Essex: Longman Scientific & Technical.

Dijksterhuis, A. & Aarts, H. (2010). Goals, attention, and (un)consciousness. *Annual Review of Psychology*, 61, 467-490.

Farrell, B. A. (1950). Experience. *Mind,* 59, 170-198.

Flanagan, Owen J. 1992. Consciousness Reconsidered. Cambridge, MA: The MIT Press.

Funder, D. C. (2009). Naive and obvious questions. *Perspectives on Psychological Science*, 4, 340-344.

Gennaro, R. J. (2004). Higher-order theories of consciousness: An overview. In

R. J. Gennaro (Ed.), *Higher-order theories of consciousness: An anthology*. Amsterdam/Philadelphia: John Benjamins.

# Gennaro, R. T. (2012). *The consciousness paradox: Consciousness, concepts,*

# *and higher-order thoughts.* Cambridge, Mass.: MIT press.

# Gennaro, R. T. (2023). Consciousness. *Internet Encyclopedia of Philosophy.*

Goldstien, A. & Hassin, R. (2017). Commentary: definitely maybe: can

unconscious processes perform the same functions as conscious processes? *Frontiers in Psychology,* 8: 1230.

Hare, T. A., Camerer, C. F. & Rangel, A. (2009). Self-control in decision-

making involves modulation of the vmPFC valuation system. *Science*, 324, 646-648.

Hassin, R. (2013). Yes it can: On the functional abilities of the human

Unconscious. *Perspectives on Psychological Science*, 8, 195-207.

Hesselmann, G. & Moors, P. (2015). Definitely maybe: can unconscious

processes perform the same functions as conscious processes? *Frontiers in Psychology*, 6: 584.

Hobson, J. A. (2005). Sleep is of the brain, by the brain and for the brain.

*Nature*, 437, 1254-1256.

Huang, J., Wu, H., Sun, X. & Qi, S. (2023). The impact of threat of shock-

induced anxiety on alerting, orienting, and executive function in women: an ERP study. *Cognitive, Affective, & Behavioral Neuroscience*, 23, 1513-1533.

Joiner, W. J. (2016). Unravelling the evolutionary determinants of sleep.

*Current Biology*, 26, R1073-R1087.

Jones, M. W. (2016). Avoiding perennial mind-body problems. *Journal of*

*Consciousness Studies*, 23, 111-133.

Jones, M. W. & Hunt, T. (2023). Electromagnetic-field theories of qualia: can

they improve upon standard neuroscience? *Frontiers in Psychology* 14

1015967.

Kim, J. (2011). *Philosophy of mind (3ed)*. Boulder, Colorado: Westview Press.

Levine, J. (1983). Materialism and qualia: The explanatory gap. *Pacific*

*Philosophical Quarterly*, 64, 354-361.

Libet, B. (1982). Brain stimulation in the study of neuronal functions for

 conscious sensory experiments. *Human Neurobiology*, 1, 235-242.

Libet, B. (1985). Unconscious cerebral initiative and the role of conscious will

in voluntary action. *Behavioral and Brain Sciences*, 8, 529-566.

McGinn, C. (1989). Can we solve the mind-body problem? *Mind*, 98, 349-366.

Nagel, T. (1974). What is it like to be a bat? *Philosophical Review*, 83, 435-450.

Nir, Y., Massimini, M., Boly, M. & Tononi, G. (2013). Sleep and

consciousness. In A. E. Cavanna, A. Nani, H. Blumenfeld, & S. Laureys (Eds.), *Neuroimaging of consciousness* (pp. 3-21). Springer-Verlag Publishing.

Nisbett, R.E. & Wilson, T.D. (1977). Telling more than we can know: Verbal reports on mental processes. *Psychological Review*, 84, 231-254.

Rakover, S. S. (1996). The place of consciousness in the information processing approach: The mental-pool thought experiment. *The Behavioral and*

*Brain Sciences*, 19, 537-538.

Rakover, S. S. (2011/2012). Methodological dualism and multi-explanation framework: Replies to criticisms and further developments. *Behavior and Philosophy*, 39/40, 107-125.

Rakover, S. S. (2018). *How to explain behavior: A critical review and new*

*approach*. Lanham: Lexington Books.

Rakover, S. S. (2019). The Conscious Unit (CU) model: A Preliminary

Outline of a New Approach to Consciousness. *Communications of the Blyth Institute (CBI)* 1 (2): 5-12.

Rakover, S. S. (2021a). *Understanding human conduct: The innate and*

*acquired meaning of life*. Lanham: Lexington Books.

Rakover, S. S. (2021b). The two factor Theory of Understanding (TFTU):

Consciousness and Procedures. *Journal of Mind & Behavior*, 42, 347-370.

Rakover, S. S. (2023). What will happen if science will develop a theory of

consciousness? Negative Ramifications. *Journal of Conscious Evolution*, 17, 4-10-2023.

Rakover, S. S. (in preparation). The Induced-Consciousness Theory (ICT): A

New Conceptual Delineation.

Robb, D. & Heil, J. (2014). Mental Causation. In E. N. Zalta (Ed.), *The*

*Stanford encyclopedia of philosophy*, URL= <http://plato.stanford.edu/archives/spr2014/entries/mental-causation/>.

Seth, A. K. & Bayne, T. (2022). Theories of consciousness. *Nature*

*Reviews/Neurosciences*, 23, 439-452.

Uttal, W. R. (2005). *Neural theories of mind: Why the mind-brain problem may*

*never be solved.* Mahwah, N.J.: LEA.

Van Gulick, R. (1995). What would count as explaining consciousness? In

Metzinger, T. (Ed.), *Conscious experience.* Paderbom: Ferdinand Schoningh.

Van Gulick, R. (2022). Consciousness. In E. N. Zalta & U. Nodelman (eds.),

*The Stanford Encyclopedia of Philosophy*, URL = <https://plato.stanford.edu/archives/win2022/entries/consciousness/>.

Velmans, M. (1991). Is human information processing conscious? *Behavioral*

*and Brain Sciences*, 14, 651-669.

Velmans, M. (1996). Author’s response: Consciousness and the “causal

paradox”. *Behavioral and Brain Sciences*, 19, 538-542.

Wenger, D. M. (2003). The mind’s best trick: How we experience conscious will. *TRENDS in Cognitive Sciences*, 7, 65-69.

Weidemann, G., Satkunarajah, M. & Lovibond, P. F. (2016). I think, therefore eyeblink: The importance of contingency awareness in conditioning. *Psychological Science*, 27, 467-475.

Yoo, J. (2015). Mental causation. *The Internet Encyclopedia of Philosophy*, ISSN 2161-0002, http://www.iep.utm.edu/, 02/11/2015.