
David Chalmers' Theory of Consciousness: Critique and Significance

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Abstract

David Chalmers' theory of consciousness offers a non-reductive approach that challenges the attempt to explain phenomenal experience entirely in terms of physical and cognitive processes. By distinguishing physical facts from phenomenal facts, Chalmers argues that consciousness should be regarded as a fundamental feature of reality, systematically connected to physical processes through psychophysical principles. His Principle of Structural Coherence explains the relationship between consciousness and awareness, while the Principle of Organizational Invariance emphasizes functional organization as central to conscious experience. His Double-Aspect Theory of Information further proposes that information has both physical and phenomenal aspects, forming the basis of his naturalistic dualism. However, the theory faces significant challenges concerning causal closure, supervenience, psychophysical laws, functionalism, and the explanatory gap. The central unresolved issue is how distinct physical and phenomenal properties can be so precisely related without reducing one to the other.

Keywords: Chalmers; Consciousness; Naturalistic Dualism; Phenomenal Experience; Psychophysical Principles; Organizational Invariance; Information; Functionalism; Explanatory Gap; Non-reductive Theory.

David Chalmers' theory of consciousness is an attempt to develop a fundamental, non-reductive theory of consciousness. The starting point is the close relationship between physical processes and phenomenal experience. Scientific research can establish important regularities between what happens in the brain and what subjects experience. However, according to Chalmers, a merely reductive explanation is insufficient because explaining the physical or functional processes associated with consciousness does not explain why those processes are accompanied by subjective experience. Consciousness therefore requires a theory in which phenomenal facts are given their own explanatory and potentially fundamental status. Chalmers' project is not an attempt to reject science. Rather, he wants to extend scientific explanation so that it can accommodate the first-person character of consciousness. Science has to expand its horizon to capture the first-person character of consciousness.

A non-reductive theory of consciousness based on the ideas of Chalmers is built on principles that link physical processes with properties of experience. Those principles can be viewed

as a way to characterize bodily experience. From these principles, one could draw various conclusions about the types of physical systems that possess experience as well as the types of physical properties of importance for producing experience in the case of a particular physical system. Chalmers offers examples of already known psychophysical principles that could be used in the construction of a theory of consciousness. In particular, he identifies three principles, namely, the Principle of Structural Coherence, the Principle of Organizational Invariance, and the Double Aspect Theory of Information. The first two principles are regarded as systems of relations connecting processing and experience and are therefore considered to be non-fundamental principles. They do hold importance in the construction of a theory of consciousness, but they cannot be regarded as true fundamental principles.¹

The Principle of Structural Coherence

The principle of structural coherence refers to the link between the structural nature of consciousness and structural nature of awareness. As David Chalmers explains, the principle of structural coherence emerges from the isomorphism of consciousness and awareness. Any consciously perceived information can be represented cognitively according to Chalmers, therefore he states that both phenomenology and psychics of the mind are linked. The connection between consciousness and cognition provides a lot of data needed to develop a theory of consciousness. The experiential part of consciousness is referred to as “phenomenal consciousness” and awareness by Chalmers. It is the component of consciousness that performs different types of cognitive activities connected to consciousness.² At the same time, phenomenal consciousness and awareness are connected structurally. Although awareness is viewed as functional by Chalmers, it has a close connection and compatibility with experience. Wherever we can find consciousness, we also find awareness. If we deal with conscious experience in a neural system, awareness will be found in a relevant behaviour management. It means that if one can behave in a conscious way, then there is some corresponding level of awareness among people.³ This relation between conscious and cognitive structures is what gives rise to the principle of structural coherence. This principle is essentially an affirmation of the central feature that although cognitive functions do not necessarily give rise to conscious experience, consciousness and cognition are not independent of each other but are closely related.⁴

Chalmers believes that the first principle to bring in the connection between the two fields is known as reliability. His argument is that for the most part, our second order consciousness

¹ Chalmers, D.J. (1996), *The Conscious Mind: In Search of a Fundamental Theory*. New York: Oxford University Press.

² Ibid.P.218.

³ Chalmers, D.J. (1995), ‘Facing up to the problem of consciousness’, In Jonathan Shear, ed. *Explaining Consciousness – The ‘Hard Problem’*. Cambridge: MIT Press. P.22.

⁴ Ibid

judgments turn out as accurate. For example, if I state that I hear an auditory experience from my own perspective, the experience is in fact happening. Chalmers then suggests the second principle known as detectability, which would be also considered its opposite principle, because it stipulates that if something is going on in terms of experience then one is able to create second order judgements about the same phenomenon. Chalmers claims that for our principles to fulfill the psychophysical laws function, we have to interpret second-order judgments such as 'I am experiencing something red' in the way as if we stated that 'I am experiencing something caused by red.' While the relational side of 'red experience' has its own reflection from the perspective of the physical operations, the belief in the quality of red experience does not follow the laws of physical logic. It is important to note that we can recognize some experiences even if they have not attracted our attention. Actually, it is difficult to imagine an experience that cannot be noticed. Mistakes in making second-order judgments do occur from time to time. Causes of such mistakes might range from the failure to pay attention to or identify the relevant categories to such problems as a mental disorder. If second order judgments are consistently unreliable or most of our experiences are completely unsensed then our judgements about experience would not have enough correlation to reality and it would be impossible to create theory of consciousness.⁵

According to Chalmers the main idea of coherence between consciousness and cognition lies within the link of consciousness and first-order judgments rather than second-order phenomenal judgments. Awareness is psychological reflection of consciousness. Awareness is a state when the information is accessible and can be practically used in behaviour and verbal reporting. The content of awareness does not tell anything about consciousness but only resembles in time and space the content of first order phenomenal judgments.

Chalmers states, the detailed structure of visual field would be equivalent to some detailed structure of visual processing.⁶ Chalmers goes on to explain that a person's perception is not a uniform mass but has an intricate internal organization. For example, my visual field has a specific geometry. There is a large red patch, a narrow yellow patch next to it, and some white in the space in between; lines, patterns, and geometric shapes can be distinguished; and so on. In addition, memories of shapes such as cubes in three-dimensional space, the image of one object blocked by another, and other instances of the geometry of depth enrich the visual field with a variety of information that come together into a single system.

It is possible to represent all these information cognitively, within what we can think of as the structure of consciousness. Any of these structural information is open and available to

⁵ Chalmers, D.J. (1996), *The Conscious Mind: In Search of a Fundamental Theory*. New York: Oxford University Press.P.219.

⁶ Chalmers, D.J. (1995), 'Facing up to the problem of consciousnesses, In Jonathan Shear, ed. *Explaining Consciousness – The 'Hard Problem'*. Cambridge: MIT Press.P.23.

the cognitive system for use in behavioural control and is reflected in the knowledge material. Many of these systemic information may be recovered by anyone with full understanding of my neural mechanisms. An interpretation of the information made available by the visual system for later control processes will restore the geometry of the visual area. The specifics of the study will of course, be very tricky, and way beyond modern approaches, but we know that there is information. In this way, we can see that in the structure of consciousness, the structure of awareness is replicated. We are therefore able to carry out the relations that need to be called psychophysical rules between consciousness and physical processes.

In recent years, there has been a surge in research on the mind in the fields of neuroscience, psychology, and other related fields. The outcome of these studies indicates that we are getting closer to understanding consciousness in scientific terms. As explained by Chalmers, the field of consciousness aims to combine two types of information into one scientific framework: the type of information referred to as third-person data that is connected with access consciousness and the type of information referred to as first-person data that is linked to phenomenal consciousness. The third-person data that is relevant to consciousness research encompasses everything that is considered phenomena. This includes the processes and activities of conscious beings that belong to third-person information. David Chalmers provides a list of some of the relevant third-person data in his article entitled *How Can We Construct a Science of Consciousness?*, such as: external stimulus discrimination, information processing via sensory systems, automatic and intentional action, access level to the knowledge that is stored and internally represented and ability to express internal states verbally as well as to tell the difference between sleep and awake state.⁷

Data in the first person involves first-hand experiences of conscious agents. Such phenomenological data offer their own unique repertoire for the understanding of consciousness. Noteworthy examples of first-person experience would include: visual experience (such as color and depth perception), other perceptual experiences (including auditory and tactile perception), bodily experience (such as pain and hunger), mental imagery (for instance, the memory of visual images), emotional experience (for instance, feelings like happiness and anger) and time-bound thought (such as reflection and decision-making).⁸

The coherence of the two types of data requires an explanation, as this is probably the central theme of modern scientific investigation into consciousness, namely, that of identification of neural correlates of consciousness. NCC can be defined as the smallest neural circuit

⁷ Chalmers, D.J. 2004, "How Can We Construct a Science of Consciousness?" In M. Gazzaniga, ed, *The Cognitive Neurosciences*. Cambridge: MIT Press.p.1.

⁸ Ibid.

specifically correlated with conscious states. It is a precise system in the brain, whose activity is correlated with conscious states.

In case this endeavor is fruitful, we'll have the general principles which form links between third-person data and the first-person data. However, these general principles do not justify being called the fundamental principles. The principles can be complicated, restricted in terms of the kind of consciousness they relate to and different particular organisms. Chalmers argues that the science of consciousness which has completely different principles with respect to different types of consciousness and different animal species will be far from being satisfactory. One can expect that the divergence causing all sorts of chaos will be harmonized. Thus, we are hoping for principles that are universal enough to apply to any conscious organism. At the same time, we hope for these principles to be relatively simple, resembling the way fundamental physical laws are simple not in the sense that they are easy to work with. The discovery of such principles seems unreal at least in the near future, and there is no certainty that it would be possible to discover them at all. It is still not obvious what forms those principles will take. Chalmers suggests that the concepts might involve the notion of information.

The Principle of Organizational Invariance

The organisational invariance theory notes that there would be qualitatively equivalent experience with any two systems of the same fine-grained operating organisation. Every conscious experience that occurs can be entirely defined by a complete definition of the fine-grained functional organisation of a system. If the neural organization's causal patterns were duplicated in silicon, for example, with a silicon chip for each neuron and the same interaction patterns, so the same interactions would occur.⁹ It is crucial that for Chalmers functional organization can be realized in various physical systems.

The important thing is to establish how many abstract components are involved and their potential states. One does not need to worry whether the components are neurons or transistors. This is the reason why consciousness is thought of as an organizational invariant: an attribute of a particular system that remains the same throughout the functional isomorphs of the same system. It also does not matter whether the organization produces some results using silicon chips, the population of China or beer cans and ping-pong balls as long as the functional organization is correct.¹⁰

⁹ Chalmers, D.J. (1995), 'Facing up to the problem of consciousnesses', In Jonathan Shear, ed. Explaining Consciousness – The 'Hard Problem'. Cambridge: MIT Press.p.20.

¹⁰ Chalmers, D.J. (1996), The Conscious Mind: In Search of a Fundamental Theory. New York: Oxford University Press.p.249

David Chalmers creates a reductio argument against the hypothesis that the existence of conscious experience people's consciousness and its content is determined by the kind of material that forms their brain. He conducts various thought experiments to show that functional silicon isomorphs of the human brain will deliver the same phenomenology or consciousness. The reductio argument is the following: if silicon brains do not have the phenomenology, the full replacement of human neurons with silicon neurons would cause the state of 'absent qualia' and the use of gradual replacement would bring about the state of 'fading qualia'; the implementation of the technology of computer switching between neural processing and silicon processing would lead to the emergence of the phenomenon known as 'dancing qualia'.¹¹

Each of these possibilities is found problematic and implausible, thus Chalmers is led to the principle of organizational invariance, stating that consciousness arises in virtue of the functional organization of the brain. The chemical and indeed the quantum substratum of the brain is unrelated to the development of consciousness from this point of view. The generalized causal structure of the brain, an organization that could be realized in several different physical substrates, is what matters. The abstract sequence of causal interaction between different parts of a system, and possibly between these parts and external inputs and outputs, is better understood as functional organization. Chalmers considers himself a "non-reductive functionalist" and insists that conscious experience is defined by functional organization, but functional organization need not be reducible.

Chalmers's basic point is that all functionally equivalent systems have the same consciousness irrespective of their basic composition. "According to this principle, what is important for the emergence of experience is the abstract character of causal relationships between components and not their physical composition." Chalmers calls this position "non-reductive functionalism." In his view, "consciousness may stem from some physical system but this does not mean that consciousness is some physical process"; likewise, "consciousness may come out due to a functional structure but it does not extent to the field of functionalism." Thus, the theory combines the elements of functionalism and property dualism.

The Double-Aspect Theory of Information

The two preceding principles have been nonbasic principles. The two preceding principles have been nonbasic principles. By using these two principles as basics, it has become possible to make use of physical facts for the prediction of some facts of conscious experiences. Thus, Chalmers looks forward to establishing the basic principles (i.e. a certain set of psychophysical laws) that would be of particular similarity to fundamental laws of

¹¹ Ibid.p.251-74.

physics and thus would somehow provide a basis for the theory of consciousness. They encompass such concepts as "awareness" and "organization" and therefore do not seem to possess the attributes necessary to allow for existence as fundamental laws in the consciousness theory. Nevertheless, they serve as immensely significant limitations.¹² The principles that are needed are those that would correspond to the limitations mentioned above and might explain the limitations. Among the principles of this kind, Chalmers mentions The Double-Aspect Theory, which has information (as a core concept) in its name.

Based on the words of Shannon, "Wherever information exists, there is information space made up of information space".¹³ An information space can be thought of as an abstract space, which contains various states, which I will term as information states, along with the basic structure regarding the relationship in each state concerning all others. A space with two states and with the presence of some essential differences can be referred to as a primitive information space. These two states can be interpreted as two bits, namely 0 and 1. The separation of these states deprives them of their meaning. Hence, it is correct to say that this information space is duly defined by its structure. Therefore, one can think of a light switch as a two-state information space with two positions: "up" and "down" position. Alternatively, we can consider a compact disk as a space of a combination of bits. On the same grounds, information can be found in a thermostat, a book, or a telephone line.

With regard to a light switch, one can find many positions apart from "on" and "off." But only one of these positions reflects a transition between the light being switched on and switched off. The "difference" between the two states of the switch is the only one that matters for the light to be either on or off. Thus, the switch can be seen as a representation of binary information space with some states corresponding to one information state and others corresponding to the other information state.

The concept of double aspect theory rests on the observation that isomorphism exists between some phenomenal spaces and some physical information spaces. Phases/variations of phenomenal states have a structure of similarities that is similar to the structure of variations of physical processes, which is essentially derived from the observations that were made while establishing the concept of structural coherence.¹⁴ According to Chalmers in the concept of information space a physical-phenomenal link can be traced. Every time we observe an information space being realized phenomenologically, we observe the same

¹² Chalmers, D.J. (1995), 'Facing up to the problem of consciousness', In Jonathan Shear, ed. Explaining Consciousness – The 'Hard Problem'. Cambridge: MIT Press.P.26.

¹³ Shannon, C.E. 1948, A mathematical theory of communication. Bell Systems Technical Journal 27: 379-423. Reprinted in C.E. Shannon and W. Weaver, The Mathematical Theory of Communication Urbana: University of Illinois Press.

¹⁴ Chalmers, D.J. (1995), 'Facing up to the problem of consciousness', In Jonathan Shear, ed. Explaining Consciousness – The 'Hard Problem'. Cambridge: MIT Press.p.26.

information space being realized physically. And every time an experience realizes the information state, the same information state is represented in the physical carrier of the experience.¹⁵

This leads to a natural hypothesis that there are two fundamental dimensions to information: a physical aspect and a phenomenal aspect. This has the status of a foundational idea which may underlie the emergence of physical experience and clarify it. If so then data is a natural candidate for a fundamental consciousness theory to play a part. We are guided to a definition of the universe of which information is genuinely central, and on which the physical and phenomenal attributes of the world refer to two essential aspects.¹⁶

There are many reasons explaining this principle, but I shall only mention some of them. First, if we analyze the physical transformations causing the changes in the conscious experience, it will turn out that these changes are very important because they induce the changes in the information space, representing the difference of physical states that differ from each other only in their causal nature. Second, if the theory of the invariant of organization is correct, then it is necessary to find some basic organizational property to which the experience may be ascribed, and the information is the main organizational property. Third, the explanation provided here promises that the structural unity may be explained as the organization of the space of information. Fourth, the trips of cognitive account of experience point out that cognitive processing involves precisely those information states that serve as the grounds for cognitive processing. Thus, information-based theory allows us to explain the experience in line of our judgments about it.

John Archibald Wheeler proposed that the mechanics of the Universe is central to information.¹⁷ The laws of physics can be cast in terms of knowledge according to this “it from bit” doctrine, postulating different states that give rise to varying results without explicitly saying what those states are. It’s just their location that counts in the knowledge room. If so then data is a natural candidate for a fundamental theory of consciousness to also play a part. We are guided to a vision of the universe in which knowledge is genuinely essential and on which it corresponds to the physical and the phenomenal characteristics of the world in two fundamental aspects.

The principle of double aspect is highly speculative and underdetermined; there are a number of critical questions that remain unanswered. Firstly, if the premise is that everything has

¹⁵ Chalmers, D.J. (1996), *The Conscious Mind: In Search of a Fundamental Theory*. New York: Oxford University Press. P.284.

¹⁶ Chalmers, D.J. (1995), “Facing up to the problem of consciousness”, In Jonathan Shear, ed. *Explaining Consciousness – The ‘Hard Problem’*. Cambridge: MIT Press. p.26.

¹⁷ Wheeler, J.A. 1990. *Information, physics, quantum: The search for links*. In (W.H. Zurek, ed.) *Complexity, Entropy, and Physics of Information*. Redwood City, CA: Addison-Wesley.

information, then should we conclude that everything is conscious? Chalmers responds, This notion is often considered absurd or even mad, but I think it merits careful consideration. For me, it is not clear that the notion is unreasonable, and there is a certain allure about it.¹⁸ Chalmers argues that the simplest phenomenology should coincide with the most elementary form of ‘perceptual psychology,’ such as that of a thermostat.¹⁹

Consequently arises the inquiry pertaining to the type of information which has phenomenal aspect. Chalmers states, "If there is experience associated with thermostats, it is likely that there is experience all over the place: information exists wherever there exists causal interaction, and experience exists wherever there is information." Information states can be found in a rock, for example when it expands and contracts, or even in the different states of an electron. Hence, if unrestricted double aspect theory is taken to be true, there should be an experience associated with a rock or an electron.²⁰ Experience is a fundamental property and fundamental properties are more evenly spread everywhere.

But yet, one cannot help but call the above question as an open question. It seems strange that wherever relationships exist, there is also conscious experience involved. “For example, a mouse must have a more primitive structure of information processing than a human being, which, in turn, seems to indicate that its conscious experience must be less rich than that of a human being. An example of an even simpler structure of information processing could be a thermostat, which probably has nothing close to any conscious experience.” In the opinion of Chalmers, If this hypothesis holds true, this means that there is no consciousness appearing at once, as if it were the result of a sudden activity of some complex system. In other words, the presence of consciousness would be a characteristic of all kinds of processes, with really simplified processes being characterized by equal simplification of the phenomenology (i.e. conscious experience).²¹

We still obtain a more detailed understanding of the manner in which consciousness may be causally important despite the fact that the issues we've discussed haven't yet been settled. If we assume that the realm of matter cannot influence various changes, Chalmers will be forced to advocate for epiphenomenalism. Yet, if we assume that information can possess amazing properties, we would be able to realize how important consciousness is in this regard.²²

¹⁸ Chalmers, D.J. (1996), *The Conscious Mind: In Search of a Fundamental Theory*. New York: Oxford University Press.P.293.

¹⁹ Ibid. P.295

²⁰ Ibid. P.297

²¹ Ibid.p.298.

²² Chalmers, D.J. (1995), ‘Facing up to the problem of consciousness’, In Jonathan Shear, ed. *Explaining Consciousness-The ‘Hard Problem’*. Cambridge: MIT Press.p.28.

The essential relation between information and experience opens the door to greater philosophical interpretation about the world's existence. It is also observed, for example, that physics characterizes the fundamental entities only extrinsically, in terms of their relationships to other entities that are themselves extrinsically characterized, and so on. The inherent essence of tangible beings is set aside. Some claim that there are no such inherent properties, but then one is left with a world that is in pure causal flux (a pure flow of data) with no properties to apply to the cause. A natural speculation, provided the above, if one allows that intrinsic properties exist, is that the intrinsic properties of the physical-the properties that essentially contribute to causation-are themselves phenomenal properties. We might suggest that the internal component of information is phenomenal properties. This could address a question regarding the causal importance of experience, provided an image in which the physical realm is causally closed and experience is complementary to the physical, a natural concern. The informational view helps one to consider how experience, regardless of its position as the inherent essence of the physical, could have a subtle kind of causal significance. For the purposes of establishing a scientific theory, this metaphysical assumption is probably best avoided, but it is rather suggestive when discussing any philosophical issues.

Critical Problems in Chalmers' Theory

The theory provides an innovative framework, but several difficulties remain.

1. How are phenomenal and physical properties related? If phenomenal and physical properties are both fundamental, distinct and not reducible to something more basic, what explains their extraordinarily precise relationship? This is one of the central problems for naturalistic dualism. Psychophysical laws can describe the relationship, but the deeper question remains: Why are these particular physical states associated with these particular experiences?

2. The problem of causal closure. If physical processes form a causally closed system, the introduction of phenomenal properties may appear causally redundant. If consciousness is causally relevant, how does it enter a physically closed causal network without producing causal overdetermination or violating physical closure? The double-aspect theory attempts to address this issue, but the solution remains incomplete.

3. The problem of information. The idea that information is fundamental is attractive, but information is realized in physical systems in many different ways. It is therefore unclear precisely what kind of information possesses a phenomenal aspect. If all information is phenomenal, panpsychism follows. If only some information is phenomenal, Chalmers must explain what distinguishes conscious information from non-conscious information.

4. Functionalism and phenomenology. Chalmers combines non-reductive phenomenology with functionalism. His organizational invariance principle suggests that if two systems are

functionally identical, they should possess identical experiences. But this raises the question of whether functional organization is really sufficient to determine phenomenology. If consciousness is genuinely phenomenal, why should the same causal organization guarantee the same subjective experience regardless of the physical substrate? The theory therefore moves between functionalism and property dualism without completely resolving the tension between them.

5. Thought experiments and empirical science. Chalmers' arguments frequently depend on thought experiments involving silicon brains, absent qualia, fading qualia and dancing qualia. These experiments are philosophically useful because they test conceptual possibilities. However, the text rightly emphasizes the need to distinguish thought experiments from actual empirical experiments, especially when conclusions depend upon assumptions that may not be empirically falsifiable.

Philosophical Significance:

Chalmers' theory is significant because it challenges the assumption that consciousness can be completely explained by physical science. The distinction between the easy problems and the hard problem shows that explaining cognitive functions is not necessarily equivalent to explaining phenomenal experience. Consciousness contains a first-person dimension that cannot simply be identified with third-person descriptions of brain activity. Naturalistic dualism consequently maintains that consciousness is dependent upon the physical but not reducible to the physical. Consciousness naturally supervenes on physical organization but does not logically supervene on it.

The three principles provide a progressively deeper account: Structural Coherence establishes a systematic correspondence between phenomenal consciousness and cognitive awareness. Organizational Invariance proposes that conscious experience depends upon functional organization rather than the particular physical substrate. Double-Aspect Information Theory seeks a fundamental explanation by treating information as possessing both physical and phenomenal aspects. Together, these principles provide a framework in which consciousness is neither reduced to matter nor separated from the natural world.

Conclusion

David Chalmers' Theory of Consciousness represents an ambitious attempt to develop a non-reductive science and metaphysics of consciousness. His central claim is that consciousness cannot be adequately explained merely by describing brain functions, cognitive mechanisms, or physical processes. A satisfactory theory must explain both the objective physical structure of the brain and the subjective, phenomenal character of experience—what it is like to see, feel, think, or perceive something.

Chalmers begins with the distinction between physical facts and phenomenal facts. Scientific investigation can establish systematic correlations between brain processes and conscious experiences, but correlation alone does not explain why those physical processes are accompanied by experience. This is the central difficulty of the hard problem of consciousness. If consciousness is not logically entailed by physical facts, then a complete theory of reality must contain something beyond the facts described by physics. Chalmers therefore proposes that conscious experience should be regarded as a fundamental feature of the world, rather than something that can ultimately be reduced to physical or functional properties.

This does not mean that consciousness is independent of the brain. Rather, consciousness systematically depends upon physical organization while remaining irreducible to it. To explain this relationship, Chalmers proposes psychophysical principles or laws that connect physical and phenomenal properties. These principles would play a role analogous to fundamental laws in physics: they would not reduce consciousness to something else but would specify how conscious experience arises in relation to physical processes.

One important principle is the Principle of Structural Coherence, according to which consciousness and awareness are systematically related. The structures found in conscious experience correspond, in an appropriate sense, to structures involved in cognitive awareness and information processing. This principle attempts to explain why conscious experience is systematically connected with cognitive functioning.

Another important claim is the Principle of Organizational Invariance. According to this principle, systems with the same fine-grained functional organization will have the same conscious experiences, regardless of the material from which they are constructed. Consciousness, therefore, depends more fundamentally on functional organization than on a particular biological or physical substrate. In principle, a system made of silicon, biological neurons, or some other material could possess the same experiences if it reproduced the relevant causal organization of the human brain.

This idea leads to Chalmers' Double-Aspect Theory of Information, one of the most innovative elements of his position. Chalmers suggests that information may possess both a physical aspect and a phenomenal aspect. Physical processes and conscious experiences can therefore be understood as different manifestations or aspects of the same underlying informational structure. This provides a possible foundation for connecting mind and matter without reducing one to the other.

Chalmers describes his overall position as naturalistic dualism. It is "naturalistic" because consciousness is treated as part of the natural world and is connected systematically with

physical processes. It is “dualistic” because phenomenal properties cannot be reduced to physical properties. Consciousness is therefore treated as fundamental, in a manner comparable to the way physics treats properties such as mass, charge, or energy as fundamental. The aim is not to explain consciousness away but to incorporate it into our fundamental conception of reality.

However, this position generates several serious philosophical difficulties. One major problem concerns causal closure. The physical world is often regarded as causally closed: every physical event has a sufficient physical cause. If phenomenal properties are fundamental and distinct from physical properties, it becomes difficult to determine what causal role consciousness can play. If consciousness causes physical events, there appears to be a problem of causal overdetermination or interaction. If it has no causal influence, consciousness risks becoming epiphenomenal.

A second difficulty concerns the relationship between fundamentality and supervenience. If phenomenal properties are genuinely fundamental and are not grounded in physical properties, what explains the remarkably precise relationship between physical processes and conscious experiences? Conversely, if phenomenal properties supervene necessarily on physical or functional organization, why should consciousness be regarded as fundamental rather than derivative? This tension remains central to Chalmers’ theory.

A further difficulty concerns the apparently psychofunctional character of Chalmers’ psychophysical principles. Although he speaks of psychophysical laws connecting physical and phenomenal properties, his principle of organizational invariance suggests that consciousness depends primarily on functional organization rather than on the specific physical material implementing that organization. Thus, the theory combines non-reductive phenomenology with functionalism.

This produces controversial consequences. If functional organization is sufficient for consciousness, then a machine with the same causal organization as a human being could possess experiences indistinguishable from human experiences, regardless of whether it is made of neurons, silicon chips, or another physical substrate. This view provides a powerful response to biological theories of consciousness but also raises questions about whether functional equivalence genuinely guarantees phenomenal equivalence.

Chalmers’ use of thought experiments further strengthens his argument but also attracts criticism. Thought experiments such as philosophical zombies are intended to demonstrate that physical facts do not logically entail phenomenal facts. However, critics argue that such intuitions may depend on controversial assumptions and may not provide empirical

evidence. Therefore, a clear distinction must be maintained between philosophical possibility and experimentally established fact.

Ultimately, Chalmers' theory is significant because it attempts to move beyond both reductive materialism and traditional substance dualism. It accepts the dependence of consciousness on the physical world while maintaining that phenomenal experience cannot be reduced to physical description. His theory consequently offers a framework in which consciousness is treated as a fundamental aspect of reality governed by systematic psychophysical principles. Nevertheless, the deepest unresolved question remains: if physical and phenomenal properties are distinct fundamental aspects of reality, what explains the precise relationship between them? Chalmers' theory identifies the explanatory gap and proposes fundamental principles to bridge it, but whether merely positing such principles constitutes a genuine explanation remains controversial. This unresolved tension is precisely what makes his naturalistic dualism one of the most influential and debated approaches in contemporary philosophy of mind.

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