

I. Reductive and non-reductive theories of consciousness

A. Qualia within Functionalism

1. Nagel (qualia) and Jackson (epiphenomenal qualia) have shown the difficulty of explaining consciousness by reducing it to its functional organization; such accounts seem to neglect phenomenal experience (e.g. inverted qualia and absent qualia).
2. Unlike Block (functionalism and psychofunctionalism), Chalmers does not claim that the functionalist must abandon qualia and the folk psychology that describes it.
3. Unlike the eliminative materialists, Chalmers does not think that the terms of neuroscience will completely subsume the terms of folk psychology in defining consciousness.
4. Instead, Chalmers accepts the neuroscience of the brain's functional organization, while he posits a "fundamental theory" (i.e. non-physical) of consciousness.

B. Chalmers divides consciousness into those aspects that are "functionally definable" and those that cannot be explained by a reduction to their functional organization.

1. "The hard problem" of consciousness pertains to "experience"
2. Chalmers's nomenclature: "phenomenal consciousness," "qualia," "conscious experience," and "experience"
3. Posits a distinction between "consciousness" (i.e. phenomenal experience) and "awareness" (i.e. functional states)
  - a. Chalmers calls awareness "the functional correlate of conscious experience" ("Facing Up," 8).
  - b. Chalmers's central issue: the nature of the correlation between these aspects

C. Ways of articulating and addressing "the hard problem" of consciousness

1. "Even when we have explained the performance of all the cognitive and behavioral functions in the vicinity of experience...there may still remain a further unanswered question: *Why is the performance of these functions accompanied by experience?*" (Chalmers, "Facing Up," 5).
  - a. Moore's open question test
  - b. How does Moore's "naturalistic fallacy" relate to Chalmers's "naturalistic dualism"?
2. "We know that conscious experience does arise when these functions are performed, but the very fact that it arises is the central mystery. There is an explanatory gap...between the functions and experience, and we need an explanatory bridge to cross it" (Chalmers, "Facing Up," 6).

D. Chalmers's "non-reductive functionalism" and "naturalistic dualism"

1. "A non-reductive theory of consciousness will consist in a number of *psychophysical principles*, principles connecting the properties of physical processes to the properties of experience" (Chalmers, "Facing Up," 17).
2. "These psychophysical principles will not interfere with physical laws, as it seems that physical laws already form a closed system" (ibid., 14).
3. "This position qualifies as a variety of dualism, as it postulates basic properties over and above the properties invoked by physics. But it is an innocent version of dualism, entirely compatible with the scientific view of the world" (ibid., 15).
  - a. Chalmers's theory would expand our ontology and add something to "the furniture of the universe"
  - b. The theory depends on the nature and the strength of Chalmers's "bridging principles"

II. Structural coherence

A. Structural coherence between consciousness and awareness

1. Awareness is "direct availability for global control," i.e., information contents available to central systems.
2. A reworking of Bernard Baar's global workspace theory of consciousness, a cognitive theory

B. Further, Chalmers posits an “isomorphism” between the structures of consciousness and awareness to account for structural coherence.

1. Clark and Hardin, 1992, on the (non-reductive) structure of experience.
2. The same structural properties that characterize our subjective experience (e.g. similarity and difference relations and geometric structure) have a corresponding feature in the information-processing structure of awareness
3. Cognitive information does not allow us to directly observe conscious experience, but it does allow us to *infer* its structural properties (Chalmers, “Facing Up,” 18).
  - a. Ex. Three-dimensional structure of phenomenal color experience (visual field) and visual processing
  - b. Is the evidence of this structural coherence *empirical* or *inferential*?

C. Humean skepticism: What is the causal relationship that underwrites structural coherence?

1. “[Structural coherence] is not a *logically* necessary principle...but it is nevertheless a strong and familiar constraint on the psychophysical connection” (Chalmers, “Facing Up,” 19).
2. Chalmers seems to posit an *inference to the best explanation* for “bridging the gap” between consciousness and awareness.
  - a. Characterizes the neural correlates of consciousness suggested by Barr and Clark & Hardin as “mechanisms of awareness” (“Facing Up,” 20).
  - b. Might satisfy Nagel’s worries about subjectivity (ibid.)

### III. Organizational Invariance: Thought Experiments

A. Defense of functionalism against absent qualia and inverted qualia objections

1. Absent qualia implies “fading qualia”
  - a. Imagine two systems: a human being and a robot. Both are functionally isomorphic; the difference is that the human system is made of neurons and the robotic system is made of silicon chips. Because the systems are functionally isomorphic, we can replace individual neurons in the human system with silicon chips, along intermediate steps, until we convert the human system into a replica of the robotic system.
  - b. Chalmers asks, “*What is it like to be the systems in between?*” (“Absent Qualia”).
  - c. The systems experience either *Fading Qualia* or *Suddenly Disappearing Qualia*.
  - d. *Suddenly Disappearing Qualia* would introduce “brute discontinuities in the laws of nature” (Chalmers, “Absent Qualia”).
  - e. *Fading Qualia* would force the system into utterances completely disjunct from its experience.
2. Absent qualia and inverted qualia imply “dancing qualia”
  - a. Imagine two functionally isomorphic systems, system A and system B. A and B are identical except that a single neural circuit in A has been replaced by a silicon circuit in B. Imagine a single silicon circuit attached to the neural circuit in A, with a switch between the two. Flipping this switch would convert A into a replica of B, with qualia disappearing and appearing again.
  - b. Yet, according to the absent qualia and inverted qualia theses, there would be no way for system A to notice the qualitative changes (Chalmers, “Facing Up,” 21).
3. Chalmers’s claim: “The only physical properties directly relevant to the emergence of experience are organizational properties” (“Facing Up,” 22).
  - a. Functionalism provides “non-basic principles” for the “systematic connection between processing and experience” (Chalmers, “Facing Up,” 17).
  - b. “Non-reductive functionalism...holds that conscious experience is determined by functional organization without necessarily being reducible to functional organization” (“Absent Qualia”).
4. In effect, Chalmers has verified the *conditional*: “If one system with fine-grained functional organization *F* has a certain sort of conscious experiences, then any system with organization *F* has those experiences.”
  - a. Verifying the *logical necessity* of the premise would verify the conclusion.
  - b. But the premise itself is *empirical*, not *logically necessary* (Chalmers, ibid.).

c. Are Chalmers's arguments of *implausibility* against absent and inverted qualia strong enough even to make the *empirical* claim?

#### IV. Double-aspect theory of information

##### A. Information states (embedded) in information spaces

1. Claude E. Shannon, "A Mathematical Theory of Information" (1948)
  - a. Information as data with semantic value
  - b. Structuralism: defined in a structure of similarities and differences
  - c. Syntactic and algorithmic
  - d. Recursive: When transmitted causally through a structure of differences, information itself becomes an information space.
  - d. Information space as *physically embodied* space
2. "There is a direct isomorphism between certain physically embodied information spaces and certain *phenomenal* (or experiential) information spaces" (Chalmers, "Facing Up," 22-23).
  - a. Chalmers's claim here depends on the argument for structural coherence.
  - b. Susceptible to the same Humean skepticism about causality
3. Experience is a fundamental property, and information is its fundamental principle
  - a. Two aspects: physical and phenomenal
  - b. All information seems to have a phenomenal aspect, along a higher-order and lower-order spectrum (e.g. human beings and thermostats)
4. The phenomenal aspect of information seems to defend functionalism against implausibility charges (e.g. Searle's "Chinese Room" and Block's "Chinese Nation").

##### A Couple of Questions:

- 1) Regarding the relationship between functional organization and experience, does Chalmers's confuse the ideas of *empirical connection* and *logical necessity*? How does this affect his argument for non-reductive functionalism?
- 2) Ultimately, does Chalmers give an *empirical* account for the structural isomorphism between functional brain states (awareness) and phenomenal experience (consciousness)? If not, what is the value of his *inference to best explanation*?

##### Articles Cited

David Chalmers, "Facing Up to the Problem of Consciousness."

David Chalmers, "Absent Qualia, Fading Qualia, Dancing Qualia."