# Consciousness Defies Functionalism in Many Worlds

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#### Abstract

This paper argues that functionalism, a dominant theory in philosophy of mind, fails to adequately explain the emergence of conscious experience within the Everettian (Many-Worlds) interpretation of quantum mechanics. While the universal wavefunction contains many possible ways of decomposition, functionalism cannot account for why consciousness appears only in decohered, classical-like branches and not in other parts of the wavefunction that are equally real. This limitation holds even if those other parts do not instantiate complex functional structure. We argue that consciousness, as it is observed in many worlds, defies the predictions and explanatory resources of functionalism. Therefore, functionalism must be supplemented or replaced in order to account for the observed phenomenology.

### 1 Introduction

Functionalism holds that mental states are constituted by their causal roles or computational functions, not by their physical substrate. In classical settings, this allows for a naturalistic account of consciousness [1]. However, in the context of Everettian quantum mechanics (EQM), where the universal wavefunction evolves unitarily and contains many superposed branches depending on the decomposition [2], functionalism faces a new and unique challenge: explaining why consciousness appears to localize only within quasi-classical, decohered branches.

This paper presents a formal argument—*The Argument*—highlighting the limitations of functionalism in this context. We then consider and address potential objections to the argument.

## 2 The Argument

- (P1) Functionalism holds that consciousness supervenes on functional organization, irrespective of physical realization.
- (P2) In EQM, the universal wavefunction admits many valid decompositions into subsystems and bases, none uniquely privileged by the formalism.
- (P3) Decoherence selects one such decomposition (the pointer basis) where quasi-classical structure emerges [3].
- (P4) Conscious experience appears only in this decohered decomposition.
- (P5) Mathematically, the universal wavefunction retains significant amplitude in other decompositions, which may encode very different functional or quasi-functional structures.

From this, we conclude:

(C1) Functionalism cannot account for why conscious experience aligns with one decomposition (the decohered one) rather than any other of equal amplitude.

### **3** Potential Objections and Replies

# Objection 1: The Non-Decohered Parts Have Negligible Amplitude

One might argue that the non-decohered parts of the wavefunction have extremely low amplitude and are therefore not relevant to consciousness.

**Reply:** This objection assumes that amplitude is defined relative to the decohered branches, but:

- (R1) Amplitude is a mathematical feature of the wavefunction and can be assigned to branches under any valid decomposition—not just those selected by decoherence.
- (R2) The notion of what constitutes a "branch" depends on the chosen basis. Thus, a decomposition different from the decohered one can also exhibit significant amplitude in its components.
- (R3) Therefore, dismissing non-decohered parts as negligible implicitly privileges the decohered decomposition, which the formalism of quantum mechanics does not justify.

### **Objection 2: Only Decohered Branches Support Complex Functional Structures**

Another objection is that only decohered branches support the kind of functional complexity required for consciousness, so functionalism naturally applies only there.

**Reply:** Functionalism would predict that wherever there is functional organization—whether simple or complex—there should be corresponding conscious experience of a similar character. If there are regions of the wavefunction where only simple functional organization exists, functionalism would predict the existence of correspondingly simple conscious experiences in those regions. However:

- (R4) We do not observe such simple conscious experiences; rather, we find ourselves experiencing complex consciousness within decohered branches.
- (R5) Functionalism lacks the explanatory power to account for why such simple experiences do not occur or are not instantiated, while our complex experience is.
- (R6) Thus, the theory still cannot explain why complex consciousness is realized in decohered branches rather than a more uniform distribution of varying complexity across the universal wavefunction.

### **Objection 3: Decoherence Is Physically Preferred**

Some may argue that decoherence picks out the physically relevant basis, and thus consciousness naturally aligns with it.

**Reply:** While decoherence is physically meaningful in explaining classicality, it is insufficient to explain consciousness unless supplemented by new assumptions:

- (R7) Decoherence is an emergent and context-dependent process, not an absolute feature of the universal wavefunction.
- (R8) The alignment of phenomenology with decoherence is itself unexplained within functionalism.
- (R9) Hence, invoking decoherence as the solution reintroduces the need for a consciousness-selection principle external to functionalism.

### 4 Conclusion

The Argument shows that functionalism fails to explain why consciousness aligns with the decohered decomposition in EQM. Potential objections either assume a privileged decomposition or rely on explanatory resources not available to functionalism.

Therefore, we conclude that functionalism is insufficient in EQM and must give way to a more ontologically grounded theory of consciousness. This opens a new and fertile ground of inquiry at the intersection of philosophy of mind and quantum foundations.

## References

- [1] D. C. Dennett, Consciousness Explained, Little, Brown and Co., 1991.
- [2] H. Everett, "Relative State Formulation of Quantum Mechanics," *Reviews of Modern Physics*, vol. 29, pp. 454–462, 1957.
- [3] D. Wallace, The Emergent Multiverse: Quantum Theory according to the Everett Interpretation, Oxford University Press, 2012.