Theoretical Foundations of the Function-Dysfunction Debate: An Introduction

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In the philosophy of the life sciences, the concepts of function and dysfunction occupy a paradoxical space; for they are, simultaneously, the most indispensable and the most suspect tools in our conceptual arsenal. They are indispensable because biological and medical explanations are unintelligible without them. We cannot describe the heart without reference to the *purpose* of pumping blood, nor can we map the immune system without reference to the *goal* of pathogen defense. To purge biology of functional language would be to reduce it to chemistry alone – a description of matter in motion, devoid of the very "life" we seek to explain. Yet, these concepts remain deeply suspect. They introduce a normative dimension – a "should", a "failure", and a standard of "correctness" – into the otherwise descriptive, value-neutral fabric of the natural world. The specter of teleology – the pre-Darwinian idea that nature is designed with intent – haunts every diagnosis of pathology and every evolutionary narrative.

For the latter half of the twentieth century, the philosophical effort to "naturalize" these terms – i.e., to render them "safe" for materialist science – settled into a familiar trench warfare between two dominant schools. On one side stood the etiological (selected-effects) accounts, which ground function in the deep time of evolutionary history; for them, a trait's function is defined by the effect for which it was selected by ancestors (a heart functions to pump blood because pumping blood is *why* hearts were preserved)[1]. On the other side stood the causal-role (systemic) accounts, which bypass evolutionary history and instead analyze function as a contribution to the current capacity

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[1] J.C. Wakefield, *The Concept of Mental Disorder. On the Boundary between Biological Facts and Social Values*, "American Psychologist", 47, 1992, pp. 373-388.

of a complex system (a heart functions to pump blood because that is what it *does* right now to enable the organism's survival)[2]. For decades, this dichotomy provided a broad and relatively stable – if often contentious – map of the debate. With minor simplifications, philosophers could readily situate themselves within this landscape, and the boundary between "history" and "current mechanisms" seemed, at least in outline, reasonably clear[3].

However, as we move deeper into the twenty-first century, this apparent stability has fractured: the map no longer fits the territory. In biology, the rise of the Extended Evolutionary Synthesis has blurred the boundaries between organism and environment, showing that traits are not simply selected by nature, but also constructed through processes of niche modification. The complexities revealed by systems biology indicate that functions are often distributed, modular, and emergent, resisting simple mechanistic reduction. Meanwhile, the "organizational turn" has opened a third path, locating function not in evolutionary history or mere systemic contribution, but in the organism's autonomous capacity for self-maintenance. At the same time, increasingly urgent debates within the philosophy of medicine and psychiatry have shown that traditional functional accounts risk conflating biological or psychological variation with genuine medical dysfunction, thereby illegitimately pathologizing mere forms of human diversity. As a result, these debates cast doubt on whether the concepts of *function* and *dysfunction* can still serve as a naturalistic or non-normative foundation for defining disease and mental disorder.

Against this shifting background, and recognizing that the scope of the inquiry has outgrown the confines of a single publication, the present *Focus* is structured as a coordinated diptych, spanning two complementary parts. The first part, to which the contributions collected here belong, addresses the conceptual and philosophical landscape: how recent developments in evolutionary theory, systems biology, and the philosophy of medicine and psychiatry challenge the received categories of function and dysfunction. The second part, to appear in the next issue of this journal, turns to the practical and scientific implications of these debates, examining how these revised conceptual tools reshape modelling practices, empirical research, and scientific reasoning in fields such as neuroscience, ecology, and clinical medicine. In what follows, we therefore restrict our attention to the theoretical contours of the debate.

[2] C. Boorse, *What a Theory of Mental Health Should Be*, "Journal for the Theory of Social Behaviour", 6, 1976, pp. 61-84; C. Boorse, *Wright on Functions*, "The philosophical review", 85, 1976, pp. 70-86; C. Boorse, *Health as a Theoretical Concept*, "Philosophy of Science", 44, 1977, pp. 542-573; R. Cummins, *Functional Analysis*, "Journal of Philosophy", 72, 1975, pp. 741-764.

[3] For an extended discussion of the notion of function, presenting and comparing different traditional positions, see, for instance, A. Ariew, R. Cummins, M. Perlman, *Functions: New Essays in the Philosophy of Psychology and Biology*, Oxford University Press, Oxford 2002.

This first part gathers papers that, from multiple perspectives, address the logical, ontological, epistemological, and historical challenges posed by the concepts of function and dysfunction. Rather than merely criticising traditional accounts, these contributions undertake a more ambitious task: they dismantle and reconstruct them, proposing alternative ways of grounding functional explanation. Taken together, they outline a conceptual framework capable of accommodating biological complexity without sliding into ungrounded forms of normativity. In this sense, they provide the precise and multifaceted conceptual bedrock of the *Focus*, revisiting the logic of selection, the relation between history and structure, and the interplay between biological norms and human values. The five contributions that follow exemplify the breadth and depth of these challenges across biology, medicine, and the social sciences, each testing the resilience of existing theories by examining cases that strain their underlying assumptions and thereby clarifying where they succeed, where they falter, and where further conceptual work is needed.

Antoine Dussault's paper, *Generalized Selected Effects Functions, the Liberality Problem, and Interspecific Competition*, addresses a central difficulty in Justin Garson's generalized selected effects (GSE) theory of function: its over-inclusiveness, or liberality problem. While this issue is often illustrated through cases of sorting among abiotic items, Dussault focuses instead on the possibility that organisms might acquire functions through interspecific competition. Drawing on community ecology, he argues that Garson's similarity-of-type clause, devised to exclude these counterexamples, either collapses into arbitrariness or, if interpreted more rigorously, ends up admitting interspecific competition as a genuine function-bestowing process. On this basis, Dussault includes a "service" criterion to the GSE to better identify which selective processes are function-bestowing.

Tiago Rama and León Trelles, in *Towards Other Hybrid Theories on Mental Health*, examine Wakefield's influential "hybrid" account of mental disorder, which grounds mental dysfunction in the selected-effects theory of biological function. Against the background of recent advances in evolutionary developmental biology and agential perspectives on evolutionary theory, they offer a programmatic reassessment of hybrid theories of mental health. Their analysis proceeds in two stages. First, they systematize three major critiques of the selected-effects theory as applied to mental illness: the explanatory limitations of historical and population-based accounts, the possibility that mental traits may resist functional explanation altogether, and the need to acknowledge evolutionary processes beyond selection alone. Second, they explore alternative frameworks, particularly causal-role and organizational or biological autonomy theories, and consider how these might shape more adequate hybrid accounts of mental disorder.

The contribution by Alejandro Gordillo-García, Mirko Gatti, and Iuris Mocchiutti, *Design Without Designer? Function and Dysfunction in Cultural Evolutionary Theory*, turns to Cultural Evolutionary Theory (CET) and identifies a fundamental conceptual tension regarding how functions are understood in cultural contexts. CET imports an etiological, selection-based notion of function from biology, yet cultural traits are often intentionally designed, invoking a teleological notion of function rooted in human purposes. The authors argue that existing attempts to reconcile these viewpoints are insufficient because they fail to offer a principled and unified account of cultural function and dysfunction. Their analysis is anchored in the case of Fijian food taboos, which reveal that a cultural practice may be teleologically dysfunctional while remaining etiologically functional. To resolve this tension, they propose a multi-level framework: teleological explanations apply at the micro-level of agents and practices, whereas etiological explanations apply at the macro-level of population-level selection processes.

Giulia Gandolfi's *Physiological Function, Psychic Function, Normative Function: On the Concept of Function in Georges Canguilhem's Philosophy of Life* revisits a thinker for whom function occupies a central place in the philosophy of life and normativity. Although Canguilhem never wrote a dedicated monograph on function, Gandolfi shows that his work hinges on the idea that functions are not fixed properties of structures but expressions of the living organism's capacity to create, follow, and destroy its own norms. Her analysis of Canguilhem's notions of "biological", "psychological", and "vital" function offers a precious and nuanced contribution for any contemporary work on organismal normativity. A case study on sexual functions, interpreted through debates on intersex and subsequent theoretical developments, illustrates how biological normativity is ultimately a matter of choice, preference, orientation. In so doing, Gandolfi reaffirms both the importance and the limits of biological functionality within today's richer normative landscape.

Finally, in *Swampman Goes to the Doctor*, James Turner and Fabian Hundertmark revisit the Swampman thought experiment to ask whether evolutionary history is necessary for diagnosing medical disorder. Through two dialogues, they highlight a tension: while theoretical accounts often emphasise the role of evolutionary history in grounding disorder, everyday medical practice appears to rely primarily on current structure and function. They further suggest a possible asymmetry between somatic and mental disorders: somatic disorders are typically identified via biological dysfunction, whereas many mental disorders seem to involve violations of rationality. Yet dysfunction – and with it, historical considerations – may still be needed to distinguish normal from pathological irrationality. Rather than proposing a new theory, the authors use Swampman as an extreme case to stress-test existing accounts of function and disorder.