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Neuroethics in Principle and Praxis

Conceptual Foundations

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Meet the editor

Dr. Denis Larrivee is a visiting scholar at the Mind and Brain Institute, University of Navarra Medical School and Loyola University Chicago, and has held professorships at the Weill Cornell University Medical College, NYC, and Purdue University, Indiana. A former fellow at Yale University's Medical School he received the Association for Research in Vision and Ophthalmology's first place award for studies on photoreceptor degenerative and developmental mechanisms. He is the editor of a recently released text on brain computer interfacing with IntechOpen Publishing and an editorial board member of the journals *Annals of Neurology and Neurological Sciences* (USA) and *EC Neurology* (UK). An International Neuroethics Society Expert he is the author of more than 80 papers and book chapters in such varied journals/venues as *Neurology and Neurological Sciences* (USA), *Journal of Neuroscience*, *Journal of Religion and Mental Health*, and IEEE Explore. In 2018 he was a finalist in the international Joseph Ratzinger Expanded Reason award.

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Preface

Less than 50 years ago, neuroscientific understanding was in its infancy by millennial standards, with no consensus on such basic cell features as signal transduction, membrane channels, most neurotransmitters, synaptic circuits, and the like. In this early milieu there was little need for an ethical discipline that would be uniquely concerned with the nervous system. By 2013, in contrast, neuroscience has advanced well beyond single neuron functions, often touching on the global properties that emerge from central nervous system operation. This new era has seen, for example, the launching of national and continental initiatives in the BRAIN and Human Brain Projects, respectively, not to mention Asian and Latin American initiatives. These projects intend not only to elucidate disease mechanisms, but also to create wholly new technological approaches for exploring higher order function.

Core ethical concerns, in consequence, now touch on such significant and nervous system specific issues as the global regulation of organismal performance, an evolution in intervention that is breaching therapeutic boundaries, supraphysical notions of systemic and organizational reality, and the ontological and anthropological ground for human nature, among others. A frequent ethical theme raised by ever-greater knowledge and technical prowess over organismal regulation, for instance, is the manipulation by and interaction with technological devices, not just in regard to the potential harm that may be incurred by such devices, but also with respect to the very nature of technology and its relation to the human being. New interventional modes, accordingly, need to consider not only traditional ethical principles of medical practice, but also what is meant by health and normality. In this environment, ethical questions related to the nervous system have assumed an immediacy and significance matching the centrality of neural function in biological behavior.

Contributing to this immediacy is the fundamental value of the human being, which lends normative weight to questions, interventions, and practices influencing him or her. Additionally, the value of human well-being—or eudomaia—is of increasing normative significance. In recognition of these twin normative concerns, parallel metaethical principles invoked in such advanced technical fields as artificial intelligence, for example, place primacy on the human being and prioritize the increase of human flourishing.

On the other hand, despite a recognition of the relevance of fundamental human value, the derivation of metaethical principles that underwrite this value is by no means uniformly agreed to and reflects a turbulence in broader metaphysical notions of material reality, among other factors. This dissonance is singularly and uniquely acute in ethical issues related to the nervous system, seen, for example, in the normatively charged issue of death determinations. On the one hand, the human being is regarded as individuated and holistic, with invested value contingent to the human being in his entire corporality. Such a view is adopted in Karol Wojtyla's ethical perspective, and ascribed to in a number of religious traditions. Here the ground for value contingency emerges from the capacity for the performance of the "good," which thereby establishes the personal agent as a value locus, validating the wholly referential status of the person:

"The reality of the person inheres in morality, that morality is a thoroughly specific and connatural reality with respect to the person—with respect precisely to the person and only to the person [...] man as a man, becomes good or evil through the act."

This capacity extends, crucially, to the whole individual by virtue of an integral metaphysical unity that grounds the corporal reality of the personalist subject. Death determinations in this view, for example, reference the whole individual; hence, medical criteria need to encompass the individual as a biological whole. In other perspectives, value contingent properties emerge reductively, where they relate to the function of discrete brain operations. This latter view broadly privileges the value of the brain over that of the body, thereby creating an intrinsic dichotomy within the individual. Death determinations here thus resort to criteria that philosophically equate the human being with the organ of the brain.

Why and how the human being is normatively privileged, accordingly, emerge as core questions that ground questions of ethical praxis related to the nervous system. At its extremes this foundation is characterized by a diametric polarity, where value, on the one hand, is seen to intrinsically emerge from an integral global order that is normatively endowed from above, and, on the other hand, where human value is invested by consensus discourse in the absence of recognition of a unified corporal reality that can anchor metanorms. The introductory chapter explains the philosophical origin of the current dissonance between these extremes. Chapter 2 reflects on the former approach, in which the global order is constituted by a metaphysical principle of unity, which is grounded in a norm-oriented teleology. By adopting postmetaphysical presuppositions in Chapter 3, by contrast, value investment emerges externally from collective accession.

The challenge for developing normative praxis given this philosophical polarity is evidenced by the adjustment in weight given to traditional medical principles, e.g., non-malfeasance and beneficence vs. autonomy, and expressed in documents like Advanced Directives (ADs) that alter the balance among these principles by placing greater emphasis on the right to individual autonomy. Chapter 4 illustrates such a shift in current legislative initiatives for ADs now undertaken in Brazil. Chapter 5 returns this emphasis somewhat to value primacy in the individual by advancing a case for values-based medical care of cognitive disease, in opposition to the functionalist objectives often characterizing evidence-based medicine. Finally, Chapter 6 considers the implication for ethical praxis that occurs when subdomains of the body, e.g., nervous system vs. body, are treated as distinct ethical spheres, rather than mutually and functionally integrated systems.

It is hoped that these chapters will spur greater recognition of the relationship between the philosophical foundations of value contingency in the human body and the neuroethical praxis that flows from this relationship.

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Section 1

Introduction and Origins of Neuroethical Tension

Chapter 1

Introductory Chapter: Reconciling Neurobioethics through Nature's Lens - Metaphysical Determinants of Subjectivity

Denis Larrivee

1. Forerunners of neuroethical debate

No more than 5 decades ago, bioethics formally took the stage as an independent discipline. Intended to normatively frame the rapidly growing knowledge of biological function, the appearance of the discipline constituted a normative response to what was viewed as a morally agnostic and scientifically aseptic attitude to the investigative and utilitarian ends of biological research [1]. Inspired by a broader recognition of a science isolated from its "ought to do" dimension, highlighted in contemporaneous debates on nuclear power by such literary elites as Huxley [2], the biological emphasis sought to address a spectrum of concerns, from ecological destruction to biological weaponry and genetic engineering, among others. In coining the term bioethics, accordingly, Van Rensselaer Potter emphasized its scope as the "science of survival" that required the bridging of two cultures, one scientific and the other humanistic and moral. Given the historical context of the Cold War era, Van Rensselaer's proposal resonated broadly in its public recognition, launching bioethics as a widely motivated and widely disciplined undertaking [3].

Nonetheless, and despite the persistent public engagement with issues of ecological misuse and military use of biological capabilities, bioethics has since and relatively quickly come to be viewed as a normative extension of clinical practice. In the evolution introduced by the Dutch obstetrician Andre Hellegers, the object of bioethics was conceived as forging an ethical structure that would give intellectual scope to the ethical dimension already implicit in medical practice. In Hellegers' scheme [4], the science of bioethics was to discover and compile values in a dialog that encircled medicine, philosophy, and ethics, which would take into account the ongoing stream of information emerging from biological discovery and medical technology.

As an intellectual stepchild of ethical practices surrounding the health care of the human being, bioethics is heir to a normative tradition extending to antiquity. Premised on the recognition of the unique value within each individual, medical care has traditionally been guided by principles meant to ensure the preservation of this recognition even in circumstances of significant health risk. While this historical legacy has clearly influenced the modern understanding of bioethics, its recent emergence as an independent discipline underscores its distinction from the former and raises questions regarding underlying factors that have driven the need for its emergence. Beyond issues of the rapidity and magnitude of information acquired at ever-grander scales—which must be adequately assimilated before any therapeutic intervention—emerging core ethical concerns have been especially influenced

by their contingency to philosophical conceptions that have become increasingly pluralistic. Among these are included an increasing power over the regulation of organismal performance; an evolving conception of intervention as a therapeutic undertaking; supraphysical notions of organismal, organizational reality; and ontological and anthropological conceptions of the physical basis of human nature. A recurring theme raised by ever-greater knowledge and technical prowess over organismal regulation, for example, is the manipulation by and interaction with technological devices that bear not only on limiting their use but also on the very nature of technology and its relation to the human being. New interventional notions thus not only need to include the traditional principles of malfeasance, beneficence, autonomy, and justice but must also incorporate what is meant by health and disease, normality and deviance. Crucially, across a wide swath of the physical sciences, fundamental questions on the nature of physical reality are assuming greater prominence as the recognition of the insufficiency of compositional approaches, which have dominated scientific exploration since Descartes and Newton, impels the consideration of a more synthetic understanding of material reality, like that of entities and their relation to properties. Finally, and critically for the ethics of applied neuroscience, are ontological and anthropological concerns related to human subjectivity and its relation to the objective reality of his corporal presence in the world, concerns that have become especially acute since Heideggerian revisions of metaphysical understanding [5].

Accordingly, bioethics and medical ethics remain the scholarly objects of a philosophical tension introduced and exacerbated by the restless expansion of biological knowledge. This tension originates in the need to appropriate a philosophical conception of physical reality that can then be normatively evaluated. However, with the assimilation of pluralistic notions on the physical reality of the body—which is the direct object of medical or biological intervention—normative principles and ethical praxis themselves remain varied. That is, while ethical praxis is contingent on some action taken toward the corpus, such praxis acquires normative significance only within a conceptual framework of the contingent material reality.

The effect on ethical praxis of assimilating the current conceptual ambiguity is most acute in issues concerned with neural intervention. Indeed, ontological and anthropological tensions uniquely characterize neuro(bio)ethics as a normative discipline, which must confront concerns over the impact of intervention on global and organismal regulations, conceptually addressed in philosophy of science accounts. The uncertainty between how the individual is understood and the physical features inherent in the neural activity of the brain that enable the expression of these human features has marked the field, particularly in its development of metaethical principles that correspondingly evolve neuroethical praxis [6, 7]. This text, especially, proposes just such an illustration of the current ambiguity. Accordingly, the following discussion will seek to address this ambiguity by grounding the philosophical accounts in fundamental features of natural reality, articulated through the metaphysical understanding of the ontological subject. This grounding then engages a dialectic with the issues of praxis presented in subsequent chapters.

2. Appropriating a philosophical conception of disease for neurobioethics

2.1 Functionalism

The absence of a reconciliation between philosophical conceptions of physical reality and the neural activity of the brain suggest that interventional praxis may

best be related to medical notions of normality and disease that entail empirically accessible parameters. Neurological impairment, especially, is a significant domain of research, with an expanding fund of knowledge on the etiology of various cognitive diseases. Accordingly, in the absence of philosophical reconciliation, viewing neural intervention by the yardstick of disease replication offers a pragmatic means of arriving at normative conclusions.

Implicit in the appropriation of a disease model, nonetheless, is a conceptual interpretation of the disease state, with its understanding of normality and deviation. According to this conception, attributions about disease etiology frequently view disease as malfunction [8] and well being as a commonly observed biological order. Such functionalist notions derive their sense from what is understood of the role of a component system in "normal" operation, where disease etiologies reflect the component system's incapacity to function according to biologically ascertained standards. Normality and variance are therefore set in the context of the malfunctioning of a component's operation, for example, a cardiovascular or retinal lesion where affected anatomical and physiological zones are clearly demarcated.

According to this epistemological approach, a disease is conceived as having a causal origin affecting a specific anatomical or functional domain and generating one or more symptomatic features indicative of the disease state. Hepatitis, for example, is "caused" by the hepatitis virus, which localizes to the liver, where it displays symptoms of fibrosis. Disease states are understood to bridge two domains, one involving empirical judgments about human physiology and another concerned with normative judgments about human well-being [9]. Stated otherwise, notions of normality are articulated through the window of empirical assessment, which is used to delimit functional adequacy. Such judgments thus evoke definitions of normality and deviation that are locally applied to the affected zone. Normative judgments, on the other hand, must be elicited on the empirical judgments to ascertain whether these constitute circumstances that are undesirable or that diminish the capacity for flourishing. Normative conclusions, accordingly, constitute value judgments that are meted out with respect to an objectively accepted value standard for an empirically circumscribed zone. In adopting an analogous approach to the neurobioethics of interventions, there is thus appropriated an empirical methodology used to delimit the range of processes for which normative conclusions may be drawn.

In a Boorsian [8] conception of disease as malfunction, notably, disease features are highly territorialized in their causal structure and zone of influence. Value judgments that are contingent to such narrowly defined empirical assessments, therefore, are restricted to normative judgments on physiological normality, that is, they are primarily conditioned by the normative valuation given to attributions of functional adequacy. In bodily domains outside the nervous system, such as the liver, and even in some brain-based regions such as stroke-related lesions, this value attribution is essentially valid. However, its invocation for many other cognitive diseases, perhaps most, must confront an intrinsic, global regulatory role of the nervous system that is required to regulate organismal properties that define the individual's ontological features.

Accordingly, normative judgments that are narrowly defined by a functionalist interpretation of the disease state, and the ethical praxis that devolves from this understanding, are insufficient for evolving metaethical principles suited to cognitive intervention. Functionalist approaches to cognitive diseases thus lend themselves with difficulty to the elaboration of a comprehensive, neurobioethical praxis, due to the broader organismal role with which the nervous system is associated.

2.2 Cognitive disease and organismal unity

This broader role pertains, minimally, to capacities for unifying organismal operation and goal orientation, that is, integral and teleological features intrinsic to the ontological status of the organisms as a whole. Indeed the widespread recognition of the unique and irreplaceable role of the nervous system in mediating organismal unity has constituted an empirical pillar for philosophical conceptions of bodily integration that underwrite clinical ethics in death determinations [10]. As a fundamental capacity for goal seeking, integration is crucial to human flourishing. Hence, impairing these mechanisms can be expected to diminish this capacity and so evoke normative concern. Cognitive diseases, as mentioned, are especially prone to impairments of these mechanisms, and interventions reproducing effects of the cognitive disease states, either whole or in part, are likely to deleteriously influence them. Accordingly, they are likely to be physical conditions that would be ethically probative.

This is manifestly evident in the limiting case of bodily death, life being predicated on the body's organismal integration. With death, mechanisms of integration are no longer operative, and organismal unity is thereby destroyed. As a conceptual position universally recognized across religious, cultural, and secular scholarship [11], the loss of all organismal unity constitutes a probative, ethical imperative of ultimate and universal significance. This is also to say that while the events of death and the organismal mechanisms that work to unify the organism are physically instantiated, it is in view of the conceptual validity of organismal unity that the normative imperative is validated. By extension, factors that diminish but do not wholly void bodily integration also lessen individual well-being. A reduced capacity for intentional self-action, that is, a hallmark of several widely prevalent cognitive diseases, for example, diminishes autonomy and the satisfaction of individual need. Disturbances of self, for instance, traditionally mark the diagnostic evaluation of the schizophrenia patient [12], seen in an abnormal sense of ownership of the body, loss of ego boundary, and confused sense of self-agency. Such reduced phenomenological capacities have been shown to have their counterpart in physical features of cognition. Imaging modalities reveal, for example, a consistently high correspondence between fMRI modules and those of diffusion imaging in normal individuals, whereas those from schizophrenia patients exhibit both decreases in overall modularity and in correspondence of networks [13]. These diseases illustrate that not only the absence but also the partial impairment of physical processes for organismal integration significantly impact individual flourishing.

Taken together, meta-principles premised on disease and notions of malfunction have a practical but restricted role for evolving neuroethical praxis in the absence of philosophical judgments on global, physical attributes of the individual, of which the integrative and unitive dimension is paramount.

3. The organismal dimension of neurobioethics

3.1 Metaphysical contingency of the neural architecture

Normative conclusions that relate to a global organizational order, on the other hand, resemble ethical approaches that generalize to the individual as a whole, that is, not as an epistemological abstraction only but as a metaphysical conclusion on the natural reality of the individual, who is epistemically evident. These approaches thus distinguish themselves from those that define the human being functionally and that emphasize properties to the exclusion of their source, like that premised

on the "stream of consciousness" [7] or that of delocalized essence, like extended mind theory [6]. They are thus also distinguished from an ethical pragmatism that is contingent to notions of disease as malfunction.

Such holistic routes to metaethics typically value the individual as a normative locus that is operative in the world. By virtue of an intrinsic metaphysical unity, they then extend value contingency to the whole of the individual. Neo-Thomistic developments in the twentieth century, like that of Etienne Gilson [14], for example, draw normative value from metaphysical conclusions, prioritizing the notion of presence as action in philosophies of being. Karol Wojtyla's metaphysical approach to ethics [15], for instance, anchors the personalist dimension of intentionalized action in the unitary reality of the whole individual. As a metaethical principle, this dimension appeals to a dual normative contingency present within the individual. The personalist subject is considered, first, as an agent of ethical activity and, second, as an end for the pursuit of the good, that is, as a value contingent locus. Here the appeal is chiefly theoretical and conditioned by the analysis, since bridging these contingencies is the experience of morality in action. Consequently, as a metaethical "object" for ethical praxis, the individual capacity for moral behavior validates the acquisition of a wholly unique, value-laden referential status for the person. Kant, significantly, adopts a strikingly similar perspective, identifying the individual exclusively as an end and not as a means.

In Wojtyla's theoretical exploration, the specific focus entails the phenomenal experience of subjectivity, that is, a cognitive and conscious dimension unique to each individual. His ethical analysis, accordingly, experientially and superficially, resembles ethical approaches that are phenomenologically and functionally driven. Unlike these approaches, however, Wojtyla explicitly views these as epistemological features only and so merely outward indicators of an inner and integral unity that he terms the "human suppositum," that is, a metaphysical essence that is subjectively constituted and phenomenologically manifested.

For ethical praxis this is significant for linking all dimensions of the individual to an integral reality that is phenomenologically expressed. In fact, the absence of such a unifying dynamic leaves ethical praxis inchoate, without either a contingent locus for value or a medium for its execution. Accordingly, the identification of the subject as a metaethical principle thereby extends value to the cognitive dynamics and physical organization of the neural architecture also. Indeed, it is on the basis of the integral unity of the individual that he later cautions in *Veritatis Splendor* [16] "against a manipulation of corporeity that would alter its human meaning." For neuroethics, the utility of this metaphysical conclusion thus relates directly to the contribution of the nervous system to the unity of the person, that is, as a corporal manifestation that is enabling to a human ontological, subjective, and integrative order. In other words, by invoking the unity of the uniquely human subject, the metaphysical subject identifies in the neural operation a normative terrain.

3.2 The metaphysical subject as an ordering principle for the neural architecture

3.2.1 Integration and systemic operation

The reality of the metaphysical subject is evident through the objective manifestation of the phenomenal subject; that is, it is a reality apparent through epistemological inference. Importantly, the absence of direct empirical confirmation does not imply the absence of the subject's reality, which can be seen in the variety of human functions that are nonetheless united in each individual. The subject's epistemic appearance thus reveals the role of the metaphysical subject to be the physical realization of the integral and uniquely human subject.

This role is apparent first in a unified organizational order that is operationally confined, which is to say that the metaphysical subject is seen through the reality of organismal integration. Its dynamic unity, for instance, is a fundamental feature shaped by evolutionary forces [17]. As one entity in an adaptive space, the organism constitutes a "unit of interaction" [18] where the whole organism is molded by evolutionary pressures to acquire a suite of behavioral features maximizing its fitness.

The subject's neural "manifestation," accordingly, is not autonomously determined but is shaped by an extrinsic metaphysical order that is determinative for its expression. Indeed, it is generally recognized that material reality is subject to immaterial priors, for example, organizational principles. Recognition of these externally imposed orders can be seen in the need to invoke non-causal explananda in natural design, like the accounts used to explain the design of flagellar motors [19]. These immaterial determinants are even more apparent in the case of neural operation, where dynamic brain activity is necessarily linked to a system-wide network that subsumes regional activity to global performance [20].

Because such metaphysical determinants are only epistemically evident, however, empirically elucidating the physical mechanisms of integration becomes key to a principled neuroethical praxis. In consequence, praxis remains subject to both empirical and philosophy of science accounts for its evolution. For integration, the reconciliation of these accounts has been the subject of much debate. Although the reality of integration is evident in the natural world, its conceptual articulation through philosophy of science accounts has restricted the choice of hypothetical presuppositions used to define empirical resources. This has exposed current accounts of integration to factual inconsistencies and delayed the evolution of more realistic and comprehensive frameworks.

The somatic integrity thesis, for example, which has served as the conceptual platform for clinical determinations of death, invokes a causal, brain-directed model of integration, through which the functioning of the body's varied physiological systems is coordinated [21]. According to this understanding of integration, ethical practice is contingent on the empirical demonstration of an irreversible loss of the capacity to maintain cohesive and coordinative function, the causal origin of which is identified with the brain. Loss of brain function is therefore equated with loss of the capacity. This conception now constitutes the philosophical linchpin for what has become a global clinical praxis. Probative actions, in consequence, such as the removal of vital organs, are defined in reference to the loss of a single organ, the brain.

Its validity, however, is challenged by a number of empirical observations following a diagnosis of brain failure, including continued heart and whole body circulation [22], wound healing, temperature regulation, and even pregnancies [23]. These apparent contraindications, claims of technological artifacts notwithstanding, thus raise the issue of the nature of the brain's relation to bodily processes and so how this relation impacts the physical conception of the death event.

The challenge to the somatic integrity thesis, in fact, retrieves a systemic notion of integration, where the source of integration is understood to be delocalized and distributed within and throughout the body rather than being confined to a single anatomical region. Such a conception of unity substantially differs from the strict causal notion of imposed control used to achieve an aggregate coordinative order. By siting its origin to a single organ within the individual, the latter notion has the conceptual and diagnostic effect of segregating the brain from the body's remainder, physically, hierarchically, and functionally. Normatively, this division has created a chasm between the brain and body where the brain has acquired a valued status and the body's remainder has been relegated to a dependency on the brain's vital operation. The empirical contraindications thus evidence a form of integration that more closely resembles an integral unity shared equally by all

material components and processes of the body, *that is*, *a form of integration more closely corresponding with the metaphysical notion of unity invoked by Wojtyla*. *This altered conception has the important normative consequence of valuing the individual as a whole*. Importantly, it reveals how the understanding of normative value is itself influenced by the epistemic order of the material body.

Considerable neuroscientific evidence favoring a systemic model of bodily integration has in fact now been gathered, particularly with regard to motor dynamics. Existing studies reveal, for instance, that peripheral and central nervous system activities mutually and reciprocally contribute to integration at multiple levels. These largely plastic influences have been shown to be progressively and hierarchically scaled within the nervous system to (1) shape inward and outward flow between the brain and body, (2) generate stable representations of bodily interaction with the world, and (3) yield a dynamic, bodily integrated performance unit.

These studies underscore the unity of the body by showing that bodily sensory input molds connectivity patterns in the brain to shape the brain's responses to afferent input, that is, the body is responsible for configuring the brain's reaction to sensory information; the functional outcome of this molding is to modulate the brain's "perception" of the world as a function of the body [24], that is, to unify bodily responses to external events with respect to the whole individual.

The generation of the bodily percept appears to unify the body for performance [25]; that is, the percept is generated to unify action as originating from a single source. Accordingly, the dynamic nature of this process precludes the functional segregation of the events of the body from those of the brain. The need to achieve unity in performance, accordingly, implies that the perception of the world through the body requires the integration that is effected by the dynamical and reciprocal relations between the body and brain, *that is*, *a delocalized source of unity*, which relates the body to the world and which is fundamental to its interaction with it.

3.3 The metaphysical subject and higher-order properties

Nonetheless, *the delocalization that distinctively characterizes systemic forms leaves unexplained the presence of goal-directed behavior that is essential to autonomous living and the relation of such behavior to the mediation of systemic unity*. Notions of integration premised on a systemic model, notably, fail to account for higher order (i.e., organismal and not merely cellular and organic, organizational, and behavioral) properties constitutive of multicellular organisms generally and of humans with highly evolved nervous systems, in particular. This is also to say that while systemic models are consonant with the holistic character of living organisms [19], they do not account for autonomous behavior [26] and so are unable to account for a material realization of ontology. Such an explanation is crucial for neurobioethics in order to identify an empirically salient source of material processes undergirding ontology and structuring a systemic model of integration. The account for the "emergence" of ontology in fact is likely to conciliate with intrinsic metaphysical features of natural reality, like the relational and communicative features described by Etienne Gilson [15], *that is*, *these intrinsic features are fundamental determinants for the ontological form that is generated*. *In particular*, *they yield the most advanced expression of physical reality*, *the subjective entity*, *which*, *accordingly*, *is constituted as a metaphysical reality*, *as noted by Wojtyla*. Indeed, neuroscientific evidence on the phenomenal subject is consonant with a role for their metaphysical evocation.

Critically, empirical studies indicate that higher-order properties emerge from the corpus as a whole and that these properties implement organismal integration,

here understood as an outcome of intentional, goal-oriented behavior. Accordingly, the integral unity of the individual is directly attributed to the autonomy of the intentional subject. Drawing from Mossio and Moreno's theoretical account of organismal autonomy, notably, human ontological faculties share a profound intimacy with the body [27] both mediating bodily integration [28, 29] and sustaining life. As predicable properties of the whole, that is, emerging for the "good of the whole organism" [17], such properties are intimately linked to processes both influencing and influenced by its extended organizational form, and so are manifest in the mutually constraining influences of the peripheral and central nervous system. In other words, higher-order properties emerge from the body as a whole where they unify the body through intended global actions, including self-identity, agency, and consciousness, and so mediate a delocalized, systemic mode of integration.

The need for the emergence of these properties from the body can be seen in the case of self-identity and understood as an ability to differentiate the physical breadth that is subsumed by processes belonging to itself from those of the contiguous environment. An organism like *Caenorhabditis elegans*, for example, must identify this range through the dynamical operation of its neural architecture [30], which regulates individual motor movements in reference to this global activity. In humans this perception of self has also been shown to be a process arising from afferent, somatotopic input of the whole body [27]; indeed, in the body's absence, there would be no percept.

Similarly, the ability to initiate actions by oneself requires that these be stably linked to the self-percept [25] now known to entail a neural dynamic termed the motor image [31]. As currently understood the motor image constitutes a covert action undertaken only mentally and as a simulation of a non-executed action. That is, the motor image contains the feature elements of a motor trajectory and so contains the projected series of motions that are prospective for execution. Insights drawn from the motor image reveal that bodily representation is a key feature that frames the elements of the plan as teleologically oriented, that is, one that inscribes actions linking an agent with an objective destination. So inscribed, actions are thereby executed as a coherent and coordinated dynamical ensemble, which have a causal origin linked to the whole individual. Accordingly, features of the motor plan entail mutual though distinct contributions from peripheral as well as central origins, underscoring the essential unity of dynamic performance even in its covert formulation, and directing it toward a unique goal.

Consciousness, likewise situates as a global property enable both responsible action and the execution of higher faculties. Current insights suggest a decentralized physical origin [32], where the body contributes to the emergence of consciousness in at least two ways, by (1) creating a generalized platform that sustains a phenomenological background of mental awareness and (2) stimulating its focal emergence. Together these results argue for a complex but nonetheless shared participation of brain and body in eliciting and sustaining all higher order properties, that is, *a unified and delocalized source of bodily emergence*.

4. The advancing future: prospects for neurobioethics from a metaphysics of subjectivity

As noted, for Wojtyła, it is the dimension of metaphysics that situates the ethics of the personalist subject, where the person "constitutes a privileged locus for the encounter with being, and hence with metaphysical inquiry." In the Wojtyłan formulation, the normative value of the personalist subject thus emerges from its metaphysical and immaterial mooring, constituting the ground for its physical instantiation and the essential metaethical dimension for neuroethical praxis.

Accordingly, it grounds his claim against "dehumanizing" corporal intervention. In doing so it has a direct bearing on the construction of ethical standards that are probative, that is, the construction of normative statements that pertain to actionable standards that would or would not infringe on a specifically human meaning.

By contrast, prevailing models of the subject that are a legacy of Cartesian metaphysics, challenge, the specifically human meaning of the personalist subject that flows from his ontological primacy in the order of being. It is a challenge, moreover, also directed to the understanding of material reality. As Gillett has pointed out [33], what is evident in current debates over the nature of material reality is the extent to which the Cartesian segregation of immaterial and material dimensions and the invocation of a strictly causal model of relations suffice for ontic adequacy, that is, whether materialism alone or dualism offer adequate explananda to account for the material order. The debate on physical reality has significant repercussions in the ethical sphere, with normative consequences that impact neuroethical praxis and leads, increasingly, to dehumanizing tendencies.

How metaphysics grounds ethical praxis, accordingly, is a critical dimension often ignored in debates about human nature and its modification that are exacerbated by the advent of neuro and genetic technologies. The culmination of a multistaged metaphysical divorce has transpired since Descartes; however, its current understanding has left efficient causal and mechanistic commitments to drive the prevailing materialism of modern neuroscience, leaving a decompositional and reductive philosophy to determine how brain operation is interpreted for the foreseeable future. *Presuppositions invoked by these efforts belie the consilience with neuroscience that is more evident in Wojtyła's proposal.* Crucially, the need to account for the emergence of subjectivity from the material order, that is, the hallmark of the neural architecture, is left unexplained by the Cartesian metaphysical segregation. The ferment in current efforts to explain the reality of the brain and mind, however, indicates that modern metaphysical presuppositions that undergird neuroethics are in a process of flux. The current uncertainty surrounding the metaphysical status of subjectivity, therefore, suggests that the Wojtyłan metaphysical subject may open a new window on the objective reality of the subjective mind that will offer surer philosophical ground for neurobioethics.

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Section 2

Metaphysical Sources of Value Uncertainty

Chapter 2

Doing and Being: A Metaphysic of Persons from an Ontology of Action

Simon Smith

Abstract

A significant and worrying lacuna lies at the heart of neuroethics: viz., a coherent conception of personal identity. Philosophically, the consequences are serious; morally, they are disastrous. The entire discourse is constrained by a narrow empiricism, oblivious to its own metaphysical and epistemological presuppositions; worse still, it remains hostage to a latent Cartesianism, which logically and ontologically isolates neuroethicists from their subjects. Little wonder neuroethics lacks an anchor for its normative judgements. This chapter aims to supply that anchor. The key lies in action: action as essentially personal; acts owned; acts intended; and acts that embody those intentions that embody *meaning*. Such acts are the primary manifestation of 'personhood'; they are also socially oriented, therefore morally interesting. Action locates persons in a world of objects and, most importantly, others. Crucially, relocating neuroethics within this context of personal activity supplies the logical and ontological foundations for both its judgements and its participants.

Keywords: action, agency, anti-metaphysical, applied metaphysics, Austin Farrer, intending, intentionality, interaction, interpersonal, Ludwig Feuerbach, neuroethics, personal identity, personalism, personalist metaphysics, persons

1. Introduction

A significant and worrying lacuna lies at the heart of neuroethical debate. What it lacks is the anchor of a *desideratum*: namely, a full and proper understanding of persons. Given that persons and personal relations are the neuroethicist's primary subjects, both of observation and judgement, this is no minor omission. Philosophically, its consequences are serious; morally, they are disastrous. They leave neuroethics caught on the prongs of a fork quite as uncomfortable as any David Hume might proffer. On one side, the entire discourse is constrained by a kind of empiricism, narrowly reductive and oblivious to its own metaphysical and epistemological presuppositions; an empiricism constituted not by controlled experiment but by the products of an outdated and radically abstract rationalism-cum-realism. On the other, and pointing uncomfortably in the opposite direction, is a latent Cartesianism that logically and ontologically isolates the neuroethicist from her subjects. Ultimately, both sides can only end by eliminating the moral subject, so drive the discourse into literal non-sense. Little wonder, then, that neuroethics lacks an anchor for its normative judgements.

This chapter aims to supply that anchor, to articulate a conception of persons that will overcome this piercingly divisive dichotomy. It does so, not by privileging one side over the other; a pointless exercise in any event, since neither one is coherent and, besides, they terminate in the coinciding of reductive and flattened abstractions with inflationary, transcendentalised ones. Rather, the dichotomy is overcome by a conception of consciousness grounded in action: action as essentially personal; actions owned, intended; actions that embody those intentions, embody *meaning*. Such actions are the most fundamental manifestation of 'personhood.' They are also socially oriented, therefore morally interesting. Action locates persons in a world of objects and, most importantly, others. Crucially, locating neuroethics within this context of personal activity supplies the logical and ontological foundations for both its judgements and its participants.

It is in this empirical sense—the philosophically well-brought-up reader may be reassured to learn—that our conception of persons is to be understood as metaphysical. Our aim, in short, is not to critique the neurosciences or rebut their discoveries. It is no part of our case to deny the role played by understanding the brain and brain-function in understanding consciousness and 'personhood.' We wish, rather, simply to demonstrate that—if we may be forgiven—there is more to persons than meets the fMRI.

Personal action is ontologically primitive; it is also empirically, which is to say experientially, irrefragable. I cannot deny the reality of my actions without self-stultification, let alone self-contradiction; no more can I deny the actions of others, actions in which my own are but one ingredient. Action is the foundation, the condition, of experience, so meets Ockham's razor, edge to edge. As such, action is also *anti*-metaphysical. It refutes absolutely those classical abstractions that claim existence beyond or apart from our experience, the being or essence, secure in its ontological priority, which, having no effect upon us, makes no claim on our knowledge.

Put simply, personal action is an anti-metaphysical metaphysics. As such, it is also an *applied* metaphysics. It supplies the clue to real existence, such as the ephemera of mere appearance and classical being-concepts cannot do. In the words of the Oxford philosopher and theologian, Austin Farrer, *esse est operari*: to be is to act, better still, to *inter*act [1, p. 21].

There is one further point before embarking on the discussion proper. What follows operates solely from a philosophical perspective; for it is this perspective, we are reliably informed, that neuro*ethics* most sorely needs. As such, we hope to introduce to current neuroethical debates several thinkers with whom the reader may be unfamiliar but who may, nevertheless, have a valuable contribution to make.

2. Empiricism, realism, and absence

Let us begin with an account, in general terms, of the philosophical problem circumscribed by this lacuna in the discourse.

It is tempting, at first, to state the obvious and assert that the dichotomy threatening to tear neuroethics asunder is a product of reductive physicalism or philosophical materialism. Such reductivism is, after all, characteristic of the scientific method that determines the course of neuroscience and so must inform the neuroethicist's outlook. In consequence, said neuroethicist will inevitably identify consciousness with the neurological, i.e. physical, processes mapped by fMRI scans and, therefore, persons with brains. All this may be true. And yet, we would do well to remember that the obvious does not always stand on solid philosophical ground; besides which, the assertion is easily countered.

During the last century, the physical sciences have seen such extraordinary—one might even say *miraculous*—advances in almost every area of human knowledge that their efficacy is not seriously to be gainsaid. The origins and nature of our species, of the universe, of life itself, have been brought within the purview of human understanding, thanks in no small part to the rigorous and systematic application of scientific method. That method's powers of description and prediction have repeatedly and with remarkable consistency proved their worth; that the exercise of such powers stands firmly upon evidence which can, by and large, be replicated and validated surely settles the matter. Under the circumstances, it is difficult to imagine what more scientific method and its practitioners could reasonably do to demonstrate their epistemic credentials.

So much for tilting at windmills. In reality, we surrender to that first temptation and point our superior philosophical finger at the neuroscientist, only to commit the very mistake we accuse her of, thereby reinforcing an already apparently intractable conflict between two different modes of thinking. Fortunately, it is an important principle of our anti-metaphysical metaphysics that pointing fingers point in two directions at once: acts unfold in consequences, so identify the objects on which they bear; simultaneously, however, they reveal intentions and, crucially, the agent of intentions. The root of the problem, that is, lies not in a faulty science, but in bad philosophy; our obvious assertion is itself symptomatic of the very confused and erroneous thinking that gives rise to the problem. We have, in short, transformed method into metaphysic, and a wholly incompatible metaphysic at that.

The results are incompatible because the transformation issues in some form of realism. It is not, perhaps, that naïve realism which supposes, in Russell's pithy phrase, 'things are what they seem.' Nevertheless, it is close cousin to that self-same 'plebeian illusion' which Einstein described, 'according to which things "are" as they are perceived by us through our senses;' excepting that, in this instance, experiment and observation substitute for sensory perceptions [2, p. 20]. In fact, this substitution means that our method-cum-metaphysic mirrors most closely Peter Byrne's 'innocent realism' [3]. This, we are told, 'merely reflects on the content of our empirical claims, notes that most of them do not speak about how the world looks from a human perspective and concludes that the world, its things and properties, is for the most part independent of us and our representations' [3, p. 40]. That we do not articulate our presuppositions, it does not, of course, follow that there are none to articulate. However, the point is clear: no matter what the epistemic medium may be, we are still claiming to identify, to know about, a world that lies, logically and ontologically, beyond the reach of any actual or possible experience.

Any such claim must prove deeply problematic for the empirically minded, not least because it marks an attempt to found scientific knowledge on that which is *a priori* unknowable.[1] The realist claim to know the world as it is *in itself* is one for which no evidence, for or against, can be found. We do not have the epistemic tools needed to "get behind" our experiences even to establish *that* such a world exists, let alone what it might be like. Logically speaking, therefore, the claim is evidently not false as such, but meaningless. To gloss over such implications, as Byrne does, with an airy expression such as 'minimally dualist' cannot help us [3, p. 35]. Minimal or maximal, it makes no difference; the breech is opened between our experience of the world and the world as it *really* is.

Per contra, empirical investigation deals in the products of experience; scientific method, in those of experiment. Those products are, in effect, maps of the physical

[1] The realist is faced with, in Farrer's words, 'an X absolutely undefined;' and so must answer the question, 'How do I know that it is not the snort of a hippopotamus or the left great toe of an archangel or the taste of asparagus?' [4, p. 88].

universe, diagrams, not of the world as it is *in se*, but as it is diagrammatisable: known and knowable by those who explore and explain it. This may seem clearest in those fields, such as quantum physics and speculative cosmology, where mathematics is the *lingua franca*. It should, perhaps, be clearer still in those where computer modelling has become a vital tool, as in the cognitive and, specifically, neurosciences themselves.

Those maps, models, and diagrams are endowed with objectivity by the formulation and application of rules for their construction, rules that constitute the theoretical framework within which any scientific enquiry must be pursued. The more completely and systematically those rules can be defined, the more likely it is they will supply objective facts; but they are not and cannot be 'independent of us and our representations' as the realist imagines. They are objective insofar as they overcome the limitations of the individual enquirer's perspective by abstracting from the subjective immediacy of ordinary sense experience. As the philosopher and physical chemist, Michael Polanyi explained, rules disregard the individual's 'normal approach to experience,' so remain 'unaffected by the state of the person accepting… [them].' They come 'between our senses and the things of which our senses otherwise would have gained a more immediate impression,' so regulate the organisation and interpretation of those impressions. What is more, and in some ways more important, those rules are open to evaluation by all those qualified and equipped to do so: viz., the community of enquirers. Hence, their objectivity is underwritten by universal acceptance: the acceptance of all those participating in scientific research, whatever their field [5, pp. 3–4].

To suggest, as we have done, that empiricism and metaphysical realism are incompatible may be strictly true, but it is also, in one rather limited sense, somewhat misleading. In fact, there comes a point within the rationalist's abstract conceptualising when the opportunity arises for, not merely for compatibility, but for full-blown coincidence. This is the precise point at which realism becomes idealism and vice versa.

For realism, the point arrives when it finally acknowledges the implications of its supposedly 'minimal dualism': 'how we say things are is one thing, how things *really* are is another' [3, p. 115]. Empiricism, by contrast, reaches this point when it conceives itself as a kind of phenomenalism or sense datum theory. In search of absolute objectivity, it adopts the pose of the passive observer, there only to discover that its 'only contact with objects, and with the world of physical things, is through perception, in which objects are presented to…[the] passive mind' [6, p. 50].[2] Stuart Hampshire called this the 'deepest mistake in empiricist theories descending from Berkeley and Hume;' that is, the 'representation of human beings as passive observers receiving impressions from "outside" of the mind, where the "outside" includes their own bodies' [6, p. 47]. Faced, not with real things, but only appearances, phenomena, the products of our sensory apparatus, the empiricist, like the realist, is forced to admit that 'we know nothing about that part of the world existing independently of us' [3, p. 44].

The root cause of this metaphysical mistake lies in the assumption that the neuroscientist's models and diagrams obtain a precise correspondence with the objects modelled and diagrammatised. In representing the biochemical processes of the brain, it is supposed, the fMRI scanner supplies a literal image of, not the corollary of consciousness, but of consciousness itself. Persons, then, are at most a product of, and at least equivalent to, those biochemical processes.

[2] See also Farrer: 'Abuse of the analogy between sight and understanding is one of the great philosophical delusions' [7, p. 29].

The difficulties that beset such reductive conceptualising are both numerous and notorious; not least, is the tendency to eliminate the moral subject, thereby rendering the whole neuroethical debate redundant. There is little profit to be had from arguing about the moral properties and capabilities of physical processes which are incapable of choice and therefore of responsibility. Any attempt to do so can be no more than anthropomorphic projection: the imaginative conception of impersonal forces as personal ones, which are themselves, we must remember, reducible to the very forces being imaginatively conceived. The rank confusion and, indeed, circularity, entailed by such a move is, we trust, entirely obvious.

A more serious problem, however, may be that equating persons to sheer physical process threatens to eliminate the possibility of meaningful discourse. It does so because, in and of themselves, physical processes do not possess logical properties. The firing of neurones may occur or it may not, but such an event cannot be *true* or *false*. There is, as Farrer points out, 'no physical act… which consists in [affirming or] negating,' [8, p. 41] only the actualising of one particular process or another, the impact of one force or another. Determine conscious, personal actions, such as the forming of hypotheses or the performing of experiments, as nothing but physical processes functioning according to causal regularities, however, and we refute the 'whole assumption of logical study. In effect, we deny that 'meaning governs the formation of discourse' [8, p. 79]. Not only does this put paid to all forms of systematic enquiry, such as the sciences and philosophy, it leaves us, as P.F. Strawson pointed out, unable to explain the meaning or function of personal pronouns such as 'I' and 'my', 'you' and 'your' [9, p. 98]. The realist, in short, lacks the means to identify herself or anyone else.

It is worth repeating, for clarity's sake, that it is not the reductive materialism, so called, of the neuroscientist or her *methodology* at fault here; it is the realism of the philosopher. The moral and metaphysical consequences of that are quite serious enough to be going on with, not least because they tempt us into that latent Cartesianism alluded to at the beginning of this chapter.

Put simply, the neuroscientist may, if she chooses, conceive of the subjects of her research in purely physical terms, but she cannot conceive herself in the same way. Deny this, and she must concede that her own descriptions of neurological phenomena and all the activities that give rise to them are themselves purely physical phenomena. As such, they must be governed by the same laws of cause and effect that govern all other physical phenomena. There can be no exceptions: the formulation of hypotheses, the devising and performing of experiments to test them, the analysing of results; the sharing of ideas: none of these events can be governed by meaning.

But that is absurd. The neuroscientist's experiments do not occur, either by accident, or as a function of causal impacts; no more than do the institutions in which neuroscientists work. They are intended activities that some*one*—as opposed to some*thing*—*meant* to do.[3] Their enactment is governed, as all personal actions are governed, by the ideas being expressed and explored; specifically, they are governed by the meaning of the terms in which they and the methodology used for exploring them are expressed. Ultimately, they are governed by the rules, the conventions and traditions, of the scholarly community to which the neuroscientist belongs. That is the social and intellectual framework in which her work is undertaken and without which would not be possible, let alone meaningful. Logically speaking, then, what is true of persons and brains in general cannot be true of the neuroscientist herself in

[3] See Robert Spaemann: '[t]o be 'someone' is not a property of a thing, whether animate or inanimate; it is not a predicate of some previously identified subject. Whatever we identify, is identified either as someone or as something from the word go' [10, p. 237].

particular. To avoid self-contradiction, she must, as Farrer put it, take herself 'clean out of the system of nature' [8, p. 79].[4] She cannot be physical as the subjects of her research are physical because physicality reduces to causal uniformity. *Ontologically* speaking, therefore, she must conceive of herself as utterly unlike the persons and brains found in her neuroscientific descriptions. She is, by necessity, a different order of being.

Having styled herself, no doubt unwittingly, after Descartes' *res cogitans*, the neuroscientist-cum-neuroethicist finds herself without a physical *modus operandi*: i.e. a body. She has logically and ontologically disconnected from her sensory apparatus and, consequently, all conceivable objects of experience. Her thoughts, then, whatever they may be about, have no experiential content; what remains but thought thinking itself in isolation? Most poignantly, perhaps, her thoughts can have no moral content either, for she has neither means nor opportunity to encounter moral selves. She cannot, in fact, even be sure that any others *like herself* exist, as Descartes himself memorably observed [11, p. 85]. Finally, and perhaps worst of all, along with her physicality, she has surrendered even the most basic forms of *self*-reference and *self*-knowledge. In abstraction from its *modus operandi*, thought thinking itself lacks the 'directedness' or 'aboutness', which makes it what it is. In abstraction, consciousness cannot act deliberately or intentionally. The attempt to preserve some notion of meaningful activity from physical reduction has backfired. Real relations have been surrendered to arbitrary connections, the random collisions and mutual modifications of impersonal forces: no consciousness required. Echoing Hampshire, the neuroscientist is forced to admit that 'I do not know how I would identify myself as a disembodied being and I do not know what this hypothesis means' ([6], p. 50; see also [9], p. 102).

The bridge between consciousness and the world is broken. We no longer have the means to identify other persons or even ourselves, let alone effect any kind of moral impact. The question we must face, then, is this: under such circumstances of Cartesian ego-isolation, what, in the end, is neuroethics actually *about*?

3. Empiricism, action, and presence

To answer that question, we need only return to our empirical starting point. Consciousness must be reconnected with the world; an easy task since we have, the sciences remind us, the very tools to hand. As Ludwig Feuerbach put it, 'the necessity of this connection is only sensation' [12, p. 52]. So saying, Feuerbach admonishes us to reject the demand for mind-independent reality and turn instead to those engaged in exploring and explaining the world, those for whom '[t]ruth, reality and sensation are identical' [12, p. 51]. Only there we shall find the conditions of real knowledge. In their activities, he argued, we may plainly see that '[o]nly a sensuous being is a true and real being. Only through the senses and not through thought for [or in] itself is an object given in a true sense.' Crucially, we must be as rigorous as Feuerbach in the application of this principle, so insist that 'not only the external

[4] This, as Farrer observed, gives rise to a whole host of curious questions, not the least of which concerns the place of the neuroscientist herself in evolutionary history. How, that is, did the neuroscientist's own mind evolve? Since it is no longer a feature of the natural universe, neither is it subject to the requirements of 'natural utility' or 'survival value' as these terms are currently understood. According to Farrer, it seems that the neuroscientist can only consider the existence of her own mind as being some kind of 'treat' or gift bestowed upon her by nature. Such a supposition, however, evidently requires the kind and degree of personification of the natural world that is hardly tenable [8, p. 78].

but also the internal, not only the flesh but also the mind, not only the object but also the ego are objects of the senses' [12, p. 58].

That 'sensuousness' lays the foundations for a more cogent and, ultimately, altogether practical epistemology. At the same time, it provides the terms for constructing—or perhaps more accurately, *construing*—an empirically sound metaphysics. According to Marx Wartofsky, the key to both epistemology and metaphysics may be found in a 'much-inflated yet workaday German expression' [13, p. 18]. With it, he argues, Feuerbach could unlock the significance of sensuousness and sensory experience while resisting the Cartesian lure to transform empiricism into phenomenalism and physical reduction into realism. In Feuerbach's hands, that is, sensory experience is not 'to be understood…on the "observer" or "perceiving subject" or "spectator" model of [traditional or simple] empiricist epistemology.' By extension, consciousness is neither 'a conglomerate of physical atoms, nor…a bundle of sense impressions' [13, p. 5]. Rather, Feuerbach's empiricism, his sense and sensibility, points to a conception or 'model of a being that is already involved in the world by its very nature. The context of *sensation* is therefore this primary involvement, this *Dasein*' [13, p. 377].

While it is perfectly true that, for Feuerbach as for Heidegger, '[t]o-be-here [*Dasein*] is the primary being, the primary determination,' [12, p. 61] this *Dasein* is not, *nota bene*, that later and better known manifestation: Heidegger's neutral substrate, which apparently lacks the virtue of being any particular being, any particular where; in David's Jasper's words, 'not…my being or any specific "being"… [but] simply "being there" in the universe' [14, p. 104]. Contrariwise, Feuerbach's *Dasein* is a philosophical baseline, for *Dasein* or 'being *here*' is active existence. Wartofsky explains: it denotes 'the original locus of being itself, as *a spatio-temporal here and now*, a concrete *being here and now*' [13, p. 376; emphasis added].

Metaphysically speaking, it follows from this that consciousness and the world are ontologically co-terminus: the two cannot be separated, are not 'abstractable in isolation as a subject that has then to be put in relation to an object' [13, p. 377]. Instead, Hampshire agreed, we are all of us *only* aware of ourselves as 'one item of furniture in the world,' 'one physical fact among others' [6, pp. 45, 46]. It is, moreover, *only* by identifying those other physical facts that we are able to fix our own situation *in* the world. In such identifications lie the most basic existential conditions for both subject and object. This is because 'here' and 'there' are not absolute positions in space, but relative locations; more, they are concrete stages of interaction.

Otherwise put, the very possibility of self-identification depends logically on being one 'self-moving body among other bodies' [6, p. 46]. The 'being' that is *here* must, if it is to identify itself *as a self* at all, be able to change its position in relation to those other physical facts: move from *here* to *there*. The coherent conception of 'subject' and 'object' demand it, for only by being able to change its position in relation to other objects can it control its access to the world, its point of view. Further, only by controlling that point of view can it claim ownership of it, of, that is, its perceptions; and only by controlling and claiming ownership of its point of view, can it direct its attention to particular features of its environment. Last, but by no means least, only by doing all of that can any 'being' distinguish itself from the other physical features which constitute its environment. At its simplest, perhaps, '[o]nly by the exclusion of others from the space it occupies does personality prove itself to be real' [15, p. 91]. In this, it differs absolutely from the 'abstract, vague, empty personalities' of Cartesian realism.

All of which means that our Feuerbachian *Dasein*, 'being *here*', is necessarily 'being' in the operative mode, fully expressed or actualised in 'doing *that*', whatever 'that' may be. In short, consciousness is a mode of activity: not *a* being, but a *way* of being.

What we have on our hands, philosophically speaking, is a logically and ontologically primitive conception of human being as physically (and, ultimately therefore, socially) embodied. Embodiment delimits the worldly physical fact that consciousness, personality, is, so determines the self, locating it in one place *rather* than any other. It supplies what Feuerbach would call the essential 'property of impenetrability,' which distinguishes the self as one *object* rather than any other.

> *The body alone is that negativing, limiting, concentrating, circumscribing force, without which no personality is conceivable. Take away from your personality its body and you take away that which holds it together. The body is the basis, the subject of personality. Only by the body is a real personality distinguished from the imaginary one of a spectre* [15, p. 91].

No inert substance, then, but the locus of a self-moving, self-directing agency; bodily existence is the focal point from which the impacts and interactions wherein consciousness elaborates and extemporises itself are expressed. Hence, Feuerbach's avowal: 'I am a real, sensuous being, and, indeed, the body in its totality is my ego, my essence itself.' Otherwise put, the body supplies consciousness with that much-needed *modus operandi* whereby experience is granted and thought filled with experiential content. It is for this very reason that Feuerbach would so vehemently repudiate 'those philosophers who pluck out their eyes that they may see'—or as Wartofsky tellingly translates it, '*think*'—'better'. '[F]or my thought,' he insisted, 'I require the senses, especially sight; I found my ideas on materials that can be appropriated only through the activity of the senses' [13, p. 368, 15, p. xxxiv].

If consciousness is to be sufficiently determinate to know anything or do anything, then it must, in Farrer's phrase, be 'perfectly embodied;' at once, both subject and object of experience, consciousness is a feature of the world and so 'does nothing here without the body' [8, p. 60]. Crucially, it is this capacity for doing that supplies the ontological and epistemological foundations of a concrete— i.e. combinatorial—ego-profile. That is the ground upon which we shall build our anti-metaphysical metaphysics. Put simply, the physical extensions of consciousness supply our criterion of real being. They do so, because our first and most fundamental experiences are, as the empiricist knows full well, objects 'of the senses, perception and feeling' [12, p. 55]. So saying, Feuerbach would use action, more properly *inter*action, to elevate empirical principle. Real beings are known, he argued, only 'where my self-activity finds its boundary or resistance in the activity of another being' [12, p. 51]. That is why, first Farrer would identify 'the primitive sense [as] "touch"' [1, p. 232] and then Hampshire would do likewise, describing '[t]ouch, and not sight, [as]... primitively the most authoritative of the senses, the natural criterion of physical reality' [6, p. 48]. For both men, the reasoning was the same: 'because acting upon objects necessarily involves touching, the contact of my body with the resisting body that is not my own' [6, p. 48]. Thus, our very conception of 'real' is conditioned by contact, designating the boundaries laid by 'resisting bodies' as they impact on our activities.

In accessing our environment, so to speak, we are not simply pushing on an open door. We are not, as Farrer put it, 'swimming in a perfectly featureless medium;' there is no action *in vacuo* [1, p. 233]. We are, of course, 'walking the earth among all sorts of obstacles,' obstacles which evoke or elicit our actions, either by resisting our efforts to achieve some goal or by providing the means to overcome resistance. Those obstacles, those resistances, thereby determine the boundary conditions for conscious activity; without them, we could do nothing at all. Indeed, we can only walk because the ground beneath our feet provides friction and talk because other objects reflect the sounds we make. This is not to say, however, that, in setting the

boundaries of our actions, those obstacles also determine their limits. They may exhort us in the strongest possible terms not to attempt to imitate the birds; but properly managed and controlled, they enable us to build the apparatus which does just that. Their resistance, then, is the force against which intentional consciousness, 'self-activity', actively defines itself.

It follows from this that the resistance activity by which our environment is known cannot be random or arbitrary as such; otherwise our attempts to understand and ultimately control it would be fruitless. Without regularity and predictability, consciousness would have no purchase on the world. Hence, as Farrer pointed out, '[o]ur conscious experiences find themselves from the start framed by this system' this regularity and predictability [1, p. 67]. Consequently, experience of resistance, and our engagement with it, take the form of systematic intercourse or controlled interference; that, in turn, supplies consciousness with 'shape' or 'form'. In other words, the interplay between self-activity and resistance activity supplies what Farrer described as the 'natural unit of thought' [16, p. 210]. Apart, that is, 'from my experience of impinging upon, and being impinged upon by, other things or forces, I have no conceivable clue to physical existence, or physical force, or physical interaction' [16, p. 210]. This is Farrer's 'causal solution' to the problems of realism, 'minimal dualism'. The world, he reminds us, 'is not known but as the playground of human thews and human thoughts; were there no free play, there would be no knowledge' [8, p. 171]. Subject and object are therefore disclosed to one another only as agents of 'free play'; the features or furniture that occupy our field of action alongside us 'only become features and so perceptible in so far as they disturb and diversify the field' [1, p. 234]. In short, the world is (recognisable as) a field of conscious activity and real knowledge is a product of our encounters in and with this field: one may come to know an object 'only in so far as it varies the disturbances of… [one's] field—[one] knows it as a class of disturbances.' We encounter 'real being' as it exercises resistance activity; we recognise it by the 'imprint' it leaves on our exploratory activities.

To speak 'objectively,' then, the world is no more or less than the combination of forces that are continuous with our active explorations. This means that the resistance activities by which the world is known to us and the controlled interference that constitutes our knowing acts are necessarily coeval: consciousness-and-the-world—if we may reiterate a central point—are co-constructed, actualised *in pari materia*. 'The bond to nature, to an objective world,' as Wartofsky puts it, 'lies in the very form of consciousness as requiring an other, that is, in the subject-object relation that is the essential form of human consciousness' [13, pp. 337–338]. This is important; it means that 'real being' is no more a corollary of physical effects than it is a by-product of conscious projection (as realist philosophers will no doubt suppose). 'Real being' is the constitutive activity of conscious physical agency, of human being.

This takes us to the ground level of a coherent epistemology. It is also the foundation stone of our metaphysics. To explain: from all that has gone before, it follows that reality as it is known, both by ordinary agents and the most scientifically well-equipped investigators, is to be found, not in inert stuff or substance, but in dynamic process. In Farrer's Latin phrase, *esse est operari*: 'real being' is full-bodied being-in-action [1, p. 21]. Being fully operational, 'being' is also fully interactive, for 'an *operatio*, *energia*, has a plurality of elements to it.' The universe and its furniture are not made of 'solid and stupid lumps of physical matter,' but of relatively stable patterns of energy, 'infinitely complicated, minute rhythms of active process, without which process, nothing would exist at all' [17, p. 40]. Pressing the point, Farrer explicitly aligned his metaphysics with the great Einsteinian advance of the twentieth century, designating '[e]nergy, rather than stuff… our

ultimate' [8, p. 52].[5] Such sentiments cannot fail to resonate with the astrophysicist and speculative cosmologist, indeed, with every scientifically enlightened thinker of the modern age. They resonate, too, with that other great metaphysician of the time, Alfred North Whitehead, for whom 'the actual world is a process, and that process is the becoming of actual occasions' [18, p. 22]. In essence, process and *energia* mean the same thing: reciprocal interference, actualities disturbing a field of activity comprised of other actualities. Real things, then, are *in and as* the mutual interplay of resistance activity or, as Farrer dubbed it, 'disturbance-effect' [1, p. 235].

Action, disturbance-effect, is our metaphysical ultimate; *esse est operari*: to be is to act, better, to interact. If this is true of the physical universe, which frames our every thought and deed—and the sciences attest that it most assuredly is—then it is no less true of the conscious, physical agents who explore and explain that universe. In Feuerbachian terms, 'the mind of man is nothing but the essential mode of his activity' [15, p. 171]. Disturbance-effect is the key to consciousness: 'that to which the personal act corresponds is not, indeed, any system of stuff, however fine-drawn, but a sequence of activity' [8, p. 26].

Thus, to identify what philosophers of mind used to call the 'seat of consciousness,' Farrer averred, we need only allow consciousness to pick its own seat by sitting in it [8, p. 24]. Do so, and we shall find that the physical 'seat', or more dynamically, 'vehicle', of consciousness is located, not in any one phase or feature of the bodily process *per se*, but in the action-pattern as a whole, the full-scale sweep of bodily movement personally executed. Consciousness is actualised or enacted in what the agent actually does: the reading of a book, the writing of an essay, the meeting or missing of a deadline. Simultaneously, of course, the action-pattern *is* the operation of all the physical processes involved, including the microscopic motions constituting the entire neurological system. That system, in each and every phase of its activity, supplies the building blocks of conscious agency. Consciousness itself, however, does not bear directly upon those building blocks; no more, of course than it bears on the large-scale extensions of the physical organism. Consciousness, as we understand and experience it concerns what we *intend to do*. Otherwise put, we do not consciously or intentionally operate the system of electrochemical processes running from brain to fingertips any more that we consciously or intentionally operate the muscles in our arms and hands. What we *do* is write an essay: our consciousness concentrates upon and is concentrated *in* those large-scale intentions, trusting the system to discharge the neurological patterns that will embody it.

This is not, if we may repeat ourselves for a second time, in anyway intended to deny or even diminish the role of the brain in conscious, personal agency. Rather, it is to bestow upon the brain its rightful role and place within the larger, bodily process, which *is* conscious agency. To illustrate, Farrer offered an analogy: 'an immensely tenuous, elongated plant, rooted in several different regions of the brain, passing its stem through the spinal column, and flowering into performance in the hand' [8, p. 26]. Consciousness, then, is not to be restricted to any particular phase of the process: it is not *in* the firing nerves, the flexing muscles, or the moving hand. Consciousness 'flowers' or comes into focus in what agents *do*, but what they *do* is embodied by the *entire* 'action plant' from root to tip. Thus, the 'whole nerve-plant from brain to hand is the vehicle or instrument of the behaviour' [8, p. 26].

This is true even when that vehicle does not appear to be moving very much at all. Thinking, for example, about how to frame this sentence is an action and so

[5] See also, Farrer: 'The notion of energies in a pure or simple state, prior to mutual engagement is physical nonsense. All activity is mutual, as between energies, and all activity thus mutually engaged changes and redistributes itself' [7, p. 82].

requires a 'nerve-plant' to embody it, however foreshortened the 'plant' may be. For thinking, Farrer, reminds us, is the 'shadow of doing' and so 'must be interpreted by a full-blooded doing' [8, p. 39]. (One suspects that this is the point where many a neuroscientist and neuroethicist commits their fatal error, mistaking this act of interpretation by means of the clue or model of bodily action for ostensive indication or direct denotative reference; and that way, as we have seen, lies metaphysical realism.) For thought apart from overt behaviour, Farrer found an interpretive key right under our noses, so to speak. 'The best sort of characterisation of thinking is that it is a sort of talking to ourselves' [7, 29]. The 'shadow-patterns' of thought follow same route as speaking, from brain to mouth, taking in lips, jaws, tongue, vocal chords and so on. But they do not get so far: the action-pattern is not fully enacted and the 'nerve-plant' fails to flower in 'full-blooded doing.' In this way, the act of thinking 'ghosts' the act of speaking, stops short of engaging the full physical apparatus of bone and muscle.

The risk of physical reduction here is palpable. As we trace out the route of our action plant, it ill behoves us to ignore the ontological dangers that lie in wait: the abstractions and disjunctions, the dissolution of consciousness into confusion and self-contradiction. Forewarned is forearmed, however; almost literally in this case for, as Farrer pithily put it, we 'still have mind on our hands just as much as matter' [8, p. 7].

In fact we have already hinted at the answer more than a little. It lies in the fundamental requirement to make sense of human action as meaningful; to recognise and understand it as governed, not by the diagrammatic laws of cause and effect, but by the rules of discourse and the conventions of the community in which we act. It lies, in short, in the logic of intending. Such logic is essentially presuppositional. It means that the very concept of action in the full and personal sense—the sense, that is, in which we experience it directly in ourselves and the other persons with whom we interact—is only complete when coupled to an intending agent: the owner of the act. In acting, the agent instantiates both the intentional and consequential motifs that make agency what it is: the 'before' and 'after' of an *esse* that actualises itself purposively, that is, teleologically, by means of some *operari*. Therein lies meaning: both theme and content of the process, without which any act is reduced to mere physical event. Stripped of this purposive structure, this 'before' and 'after', the very concept of 'action' is unintelligible. Hence Farrer reminds us, the intending that arises only in those circumstances to which the physical, bodily pattern 'reacts and only in reacting to them… has neither sense nor function.' Contain consciousness within the bounds of flattened naturalism, that is, and the 'reaction which consciousness should direct takes place in the occurrence of consciousness;' and that is no consciousness at all [1, p. 235].

Evidently, we have no wish to re-open a logical and ontological chasm so recently closed; equally, no simple reduction will do. Instead, Farrer held out for an agency 'overplus' or 'prior actuality', insisting that '[t]he *intending* is ahead of the *intended*, though it be but a hairsbreadth' [8, p. 48].[6] Note the repetition; it is as important as the differentiation it represents, for it refutes absolutely the separatist tendencies of metaphysical realism, demanding instead continuity between *intending* agent and acts *intended*. Put simply, actions, in the full and personal sense, *are* intentional; they require an agent of *sufficient* priority to intend them. Like 'a hairsbreadth', 'sufficient' denotes the briefest logical pause between becoming aware of one's circumstances and responding to them: sufficient, that is, to displace merely reflex action while the owner-*esse* of intending consciousness takes her seat, putting the intended pattern of physical action in gear and driving it off.

[6] I am indebted to Charles Conti for pointing out the significance of the double reference here.

We are not, as all of us are no doubt aware, acting and intending in a vacuum. Action and, indeed, everything we have said about it, locates us in a physical *and* a social situation. For, as we have already observed, action is always and necessarily interaction, so involves a 'plurality of elements.' All of those elements are, in a sense, physical objects; many of them are also personal others, intending agents like ourselves. The logic of intending reminds us of this, while also circumscribing the minimal requirements of prior actuality: the demands placed upon us by the presence of other persons. So much can be clearly seen, J.L. Austin has demonstrated, from the language of apology and excuses [19]. That we need and, fortunately, are able to apologise for our actions, not only reveals the personal nature of the context in which we act, but also throws the logical emphasis back upon the intending by allowing us to express what we *meant* to do.

Put simply, acting persons aspire to a lively moral perspicuity by adopting what Charles Conti describes as a 'metaphysical [i.e. ethically informed] vantage point' [20, p. 185]. We seek thereby to oversee the means towards realising consequences we actually intend and so avoid colliding with other agents. We view our proceedings, then, not as a 'Cartesian cogitator but as actor-self and monitor-self simultaneously;' and so 'perform our being as we experience it' [20, p. 185]. In such performances the Cartesian *cogito* is revised and returned, chastened by experience and recruited by agency metaphysics to do its duty *metaphorically*. Physical extension coupled with social orientation symbolically transform the realist's non-perspectival perspective [3, p. 40] into a concrete analogue for self-transcendence *in and as* 'the "owner-occupier" of deeds done; the "performer-director" of the drama of its life' [20, p. 184]. This is the 'I' of the act, the self that listens to itself, hopefully *before* speaking, but often as not through an in-built 'moral "playback" function' [20, p. 187]. Registering the reaction on the face of the other, the self seeks to make amends by resubmitting its acts for review, reinterpreting them with a view to qualifying intentions and mitigating unintended effects. Such are the lessons we all learn to invest in our proceedings, gathering 'the rosebuds of experience in daily reflection so as to remove the thorns of further disgrace' [20, p. 187].

The social orientation of action coincides—and does occasionally collide—with the 'internal' world of conscious deliberation: 'We sense our compresence with others, so intuit the obligation to act' [20, p. 186]. Alive to that 'compresence', conscious agency is quickened by the possibilities of physical interaction, personal intercourse. That defines the obligation *in* action: simultaneously enacted—obligations undertaken – and intrinsic to the logic of action—the 'ought' of my intending. Therein, Conti concludes, lies the teleology of action: being 'retrospective and reflective all at once,' [20, p. 184] end-oriented acts factor means, motive, and opportunity into intended execution.

Unearthing the roots of thought and action, we find that the logic of intending underwrites the concept 'person' as a social reality. Logic is not, however, always the most reliable guide to what does and does not exist.[7] In view of our much-vaunted empiricism, something a little more concrete would, no doubt, be appreciated. After all, as Farrer reminds us, '[i]t is not as though we believed in our neighbour's personality *because* logical philosophers are able to exhibit the self-contradiction involved in denying it' [7, p. 128; emphasis added]. No more, of course, than we should expect logical proof of our parents personhood; do so and we surely add the insult of unnecessary demonstration to the injury of inexcusable doubt. Neighbours and parents, friends, lovers, even teachers: they do not constitute a logical puzzle for us to solve. Their presence, their reality, is a matter of practical urgency; incon-

[7] This, as J.N. Findlay reminds us, is because logic provides a guide to the use (and abuse) of language, not what does or does not exist [21]. Cf. Waismann: [22, 23].

trovertibly so, since our first encounter with other persons finds us supremely helpless. John Macmurray put the point with paradoxical perspicuity when he pointed out how well 'adapted… to being unadapted' we are, 'adapted,' that is, 'to a complete dependence' on others [24, p. 48]. In short, we are 'made to be cared for'; and cared for we must be if we are to survive. Being so 'adapted', how fortuitous then that we are born into a manifold of personal agencies or, to warm the face of such schematics, a world of families and friends, of intrinsically personal love-relationships. Farrer concurred: '[f]rom first infancy,' he said, 'our elders loved us, played us, served us and talked us into knowing them' [25, p. 74]. Had they failed us, we would not be here to question their reality or cast aspersions on the meaning of their being. Indeed, we only learned to talk 'because they talked to us;' and in that talk, consciousness took its first stuttering, stumbling steps: '[b]ecause we could first talk, we can now think; that is, we can talk silently to the images of the absent, or… pretend to be our own twin, and talk to ourself' [25, p. 74].

Consciousness, then, is awakened, better still *invested*, in us by those who supply the mental and physical resources with which we explore our world, shape our place and part in it. Otherwise put, our parents and teachers—among many, many others—supply the primary conditions of our conduct, both mode and circumstance of developing personality. We can think, that is, talk to ourselves, because they first talked to us and taught us to reply. Sometimes, we can even think objectively, that is, abstract from the immediacy of experience because they taught us rules for consistently organising and interpreting it. Those rules, as we have seen, they called theories: scientific, philosophical, psychological, etc.; they mitigate the particularity of my perspective by co-opting me into a community of explorers, so make *me* one of *them*.

In this way, others supply the terms and conditions of our actions and transactions, thereby staking their claim to the very self they helped create, instilling it with what Feuerbach called 'the inner life of man': our social self, our 'species being' [15, p. 2]. Like her talk, the other is internalised, metaphysically and morally incorporated into the structure of the self. This process displaces the subjectivity of the subject: its needs, activities, perspective—all felt as intrinsically, immediately present and real, *as* its *self*—these are *first* 'filtered' by a more basic presence in the shape of the 'otherness' 'inside'. Being 'filtered', the self evaluates and re-evaluates itself, conceiving and constructing, re-conceiving and re-constructing, itself *in and as* relation. The self learns to double itself, so play the part of the other within it. In the vernacular, we might say I become a self by learning to put myself in the place of another: I become *a* self, an *I*, by re-enacting that place, that primary otherness; I become a self by being appropriated by others and learning to appropriate them in turn. In this way, the transactional structure of social conscience and conscious action are built-into the mode and manifestations of self-construction *by the other*. This overrules any ontological privilege or priority the 'I' might seek to claim over deeper interpersonal connections. Prior actuality cannot belong *essentially* to the self, for, as Farrer avers, 'mentality *always* was a social, not a solitary, thing' [25, p. 74]. Both metaphysically and psychologically, priority resides *in* the other for that is where the self is born.

Taking this one step further, it is, perhaps, sufficiently well known that the derivation of the word 'person' lies in the Latin *persona*, meaning 'an actor's mask.' A vital metaphor, this: agent and alter-ego in one. The metaphysical hint is unmistakable. Give someone a mask, as Oscar Wilde quipped, and they reveal their true selves; and in revealing, we add, so they become. As consciousness is bodied forth by the other (inside) so it is embodied *in* the self. Theirs is the mask we wear, the *persona* we appropriate and transform into a self, a conscious, personal reality, commissioned by the other. Thus does '[m]ind… everywhere flow into mind' [26, p. 143] and I learn to play my part in the exchange of perspectives on my self-enactment.

Our first performance, then, is no monologue but a dialogue with the other. In such transactions, are we made to be self-making.

The essence of consciousness, of 'personhood', is fragmentary, consolidated by these exchanged perspectives. This is a commonplace of postmodern identity theories as well as the 'metaphysical personalism' (as Conti's titled his exegesis of Farrer) that we have been mapping here. The 'unity' we call a self is actually a function of that primary dialectic of perspectives, the love-relationships into which we are born. In this way, those who had and held us have inexorably bound themselves, their image, into our *every* experience of consciousness. We are who we are by their gift; wherein, St. Paul reminds us, works the grace of God [27].[8] Others give us the tools with which to make or 'mend' ourselves (as Eugene O'Neill suggests) using that grace as 'glue' [28, p. 101].[9] They give us the language, the symbols, in which we think our thoughts and live our lives.

4. Conclusion

It seems we have, at last, reached the philosophical bottom-line. These first and most fertile encounters shape the development of conscious thought and action; they are the grounds which supply form and purpose, sometimes even content, to our explorations and explanations. This is the well-spring of human being, in Martin Buber's poignant phrase, the 'cradle of real life' [22, 29].

Here, then, is an opportune moment to take stock. Let us make the point of moral application plain. Immediately obvious is the absence of any ethical theory, our conception of persons as active agents offers no system or set of rules for the formulation of normative judgements. Being rooted in the personal relations wherein we all, quite literally, find ourselves, our anti-metaphysical, *applied* metaphysics is profoundly averse, even hostile, to such things. Indeed, as the history of Western philosophy—and any decent textbook—will show, such theorising and systematising is always inherently flawed, unable as it is to accommodate the messy and complicated cases that moral practice inevitably throws up. Real life is never black and white; for every rule there is an exception; although even the best system-builders frequently forget this, preferring as they do to exalt their abstract conceptual constructs such as reason and utility.

Applied metaphysics may leave us without a moral theory, but it does not leave us empty-handed. Instead, it supplies the very anchor that our normative judgements demanded from the start: concrete personal connection, the embodiment of moral agency. This rebuts absolutely that Cartesian ghost in—or rather *out of*—the machine, that 'being-beyond,' which remains forever quarantined from physical experience, physical knowledge, physical reality. And so the transcending ego, which passes judgement on a reality it can neither experience nor, consequently, understand, is exorcised at last. Along with it, goes the flattened naturalism which reduces personal reality to causal mechanism. In their place stands, not a concept, but a person, a conscious physical agent. This is the other with whom I am intimately and intrinsically interconnected, the living, breathing reality at the very heart of my own existence: co-constituent of my becoming, whose rightful claim upon me demands that I reciprocate, respond in kind and participate in his or her becoming. We demur at our own risk, for that way lies self-stultification; worse still, perhaps annihilation. Deny the presence of the other and coherence is corrupted:

[8] 'But by the grace of God I am what I am: and his grace which was bestowed upon me was not in vain; but I laboured more abundantly than they all: yet not I, but the grace of God which was with me.'

[9] 'Man is born broken. He lives by mending. The grace of God is glue!'

our entire moral discourse will rot. Reject their claims upon us and our very existence may be in dire peril. Regard them as mere objects, as a function of physical process or even interpenetrating forces, and we transform ourselves likewise. Action is reflexive: it reveals the nature of the agent and in revealing, actualises. Bluntly, that is, I am who and what I am through the grace (and glue) of others; without them, I am not. Therein lies the moral imperative of our anti-metaphysical metaphysics.

Philosophically speaking, of course, we have found more than a moral anchor; we also have a coherent logical and ontological framework for our discourse. Personal action supplies the context in which we may clearly see both the particular and the general: first, the analyses and judgements of neuroethics; second, the discipline as a whole and all its participants. Within this framework we may recognise, then understand, and finally overcome the 'self-sufficing speculation,' [15, p. xxxiv] which threatens to undermine our efforts. On the one hand, we recall the personal presuppositions of our empiricism: the epistemological requirements of exploring agents that reconnect experience with action, real knowledge with the controlled interference which is the neuroscientist's stock in trade. On the other, it reveals and resists the temptation to align methodology too closely with metaphysics. This, in turn, allows us to reconcile those binary oppositions—mind and body, intending and intended, subject and object—which do so much to incapacitate every branch of moral philosophy. Reconciliation comes, not by over-inflating empiricism with the transcendental pretensions of metaphysical realism, but by returning us to the only place where those abstract notions can possibly make sense. Mind is a mode of bodily action, body the physical manifestation of mind. Intending and intended are phases of that manifestation, conceptually separable but in reality, i.e. in action, continuous. Subjectivity is essentially other-oriented by virtue of being a reflection of the other who invokes and evokes it in us. Ethically, it denotes obligations owned: my responsibilities as presupposed and, moreover, delimited by my capacity to act in response to a physical and social or personal environment. Being a communal act, objectivity is coeval with this environment: it represents the truth-conditions and epistemic norms laid down by the community of knowing persons. Thus, subject and object are not independent as such, but theoretical perspectives, ways of seeing, of thinking about and understanding the world, the use of which is sanctioned by that community. This does not detract from their truth-value but merely reminds us of the context in which they are first negotiated and defined; that is, transacted with the world by the community of thinkers. Both ethically and epistemologically, then, these theoretical perspectives represent, in their contrasting but congruent ways, the very 'claimingness' of others that is our anchor.

Ultimately, then, being firmly anchored by our concept of persons to the solid, social, and inherently ethical ground that entails it, uncouples neuroethical analyses from the arbitrary dictates and philosophical fiats of classical rationalism-cum-realism. Diverted from the rabbit hole of incoherence and irrelevance, which awaits so much philosophical discourse, and possessed of a renewed social conscience, our thoughts and actions are oriented back towards the communities in which even neuroethicists must live and work. Most immediately, perhaps, is the scholarly community whose job it is to map out and delineate our discipline. Beyond that, is the academy itself, whose traditions, standards, and requirements we have imbibed, deploying them rigorously in our own practice. And if we care to look still further, beyond the halls of academe, we may even see the society whose various institutions—from the logico-linguistic to the socio-political—make our investigations possible and before which our contributions will no doubt be held to account.

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Chapter 3

Naturalizing Neuroethics? A Syncretic Approach

John R. Shook and James Giordano

Abstract

Neuroethics is uniquely situated to socially interpret what brain sciences are learning about social and moral cognition while helping society hold neuroscientific research and neurotechnological applications to firm moral standards. Both tasks, if they are to be pursued successfully, must find ways to closely relate the "neuro" with the "ethical." Keeping them apart has been the objective of nonnaturalist worldviews worried about scientism and reductionism, and now they complain about "neuroessentialism" and similar labels for dissolutions of agency and responsibility into mere brain activity. A nonnaturalistic neuroethics, on whatever metaphysical basis, insists that the biology of brains could not explain moral decisions or ground moral norms. We agree on that much, since the methodology of brain sciences presumes, and cannot replace, behavioral and psychological attributions of moral capacity and conduct. But the social and the neurological are always related through the anthropological; and that common basis is, not coincidentally, also where the ethical is grounded, as humanity upholds persons as bearers of moral worth and moral capacity. Neuroethics, by focusing on persons, need never resort to nonnaturalism to uphold what ultimately matters for ethics, and "naturalizing" neuroethics is also unnecessary for a humanity-centered neurobioethics.

Keywords: neuroethics, neurobioethics, naturalism, nonnaturalism, neuroscience, psychology, ethics

1. Introduction

In this chapter we present a syncretic approach to neuroethics, opening a conciliatory and convergent path forward for this interdisciplinary area. This approach can (1) align neuroethics with cognitive and social neuroscience as well as neurology and (2) situate neuroscience within a capacious philosophical naturalism. Keeping "neuro" primary to neuroethics for its perspective on humanity and keeping "ethics" for humanity central to neuroethics and its mission are paramount goals. Yet, those goals anticipate that neuroethics will have sufficient generality and applicability for all humanity. If the "neuro" and the "ethical" cannot be somehow harmonized, any such universality for neuroethics is unattainable. To that end, we argue here that relationships and continuities connecting (neuro)science and (neuro)ethics should be traced through domains of (natural) philosophy.

2. Metaethics and philosophy

Elsewhere, we have labeled the higher goal of universal relevance for humanity as a "cosmopolitan" aim, to solicit ethical wisdom from many cultures and elicit principles fostering ethics across societies. That aim falls under the purview of ethical theorizing, but it cannot be beholden to any particular ethical theory (such as deontology, consequentialism, virtue ethics, and so forth) or to the perennial debates among them. By setting a high methodological standard for ethical theorizing, a cosmopolitan approach enters the area of metaethics as well. However, cosmopolitan ethics, due to its attentiveness to humanity, strongly doubts that metaethics by itself is oriented toward human universality. Metaethics can easily amount to validations bestowed on one society's conventional morality over other societies or fixations with some country's linguistic habits about moral matters or a meditation upon a single culture's moral tradition.

Just as metaphysics eventually lost its credibility as an adjudicator of moral norms, skepticism toward metaethics as a lone arbiter of moral concepts and truths has also been warranted. Will further refinements to metaphysics, or metaethics, at last permit deductions of binding moral principles? That also seems dubious, as proffered derivations continue to be a plentiful source of diverse and inconsistent results. That profligacy, at least, could be reasonably expected. No narrow intellectual base could sufficiently support broad practical norms.

Looking to metaethics to adjudicate ethical theorizing and deliver a principled moral framework relevant to humanity cannot be encouraged, unless a different kind of metaethics is engaged—one that is based upon and employs a metaphysics that consults other areas of philosophy and is informed by fields across the humanities, social sciences, and life sciences. Tentative efforts and initial results on our part illustrate how such a broadly informed metaethics can yield a cosmopolitan ethical framework, which in turn suggests some principled ethical guidelines [1, 2]. We do not replicate that work here. Instead we address certain metaethical and philosophical issues of neuroethics, as it develops as an interdisciplinarity of several scientific fields. Analyses and inquiries of a philosophical nature seem inescapable, and likewise, we regard them as essential to the success of neuroethics.

But taking neuroethics to be fundamentally indebted to philosophy would not be apparent upon a survey of the many fields contributing to neuroethical concerns and inquiries [3]. The centrality of philosophical inquiry comes into view with the primary assignments given to neuroethics as an interdisciplinary enterprise (consult [4, 5]). In brief, neuroethics (i) ponders the brain's functions that are involved with personal identity, autonomy, and moral judgment/action and (ii) evaluates ways that neuroscience and technology (i.e., neuroS/T) can be developed and implemented while respecting human dignity and ethical norms. Indeed, as many have begun to acknowledge, each assignment yields information and actionable assessments that are relevant to the other assignment.

Harmony between these two assignments is hardly automatic or straightforward. Consider again the hazardous intersections of ethics and neuroscience where neuroethics has offered its supervision: first, the growing responsibility to advise or even adjust social views about psychological and neurological processes involved in moral and immoral conduct and second, the expanding ability to alter cognitive processes in ways affecting conceptions of the self and moral capacity. Unless neuroethics can coordinate the advice to society with an assessment of neuroscientific interventions, neuroethics will be unable to distinguish itself amid the cacophony of opinions about what brain science does and means.

For example, what neuroethical advice and guidance will be offered about these matters in the area of criminal justice? Imagine a defense lawyer making this argument during a trial: "Ladies and gentlemen of the jury, my client cannot be guilty because neuroscience shows that no brain is really capable of moral responsibility." And then imagine another trial, where a judge imposes this sentence: "The court requires this convicted criminal to undergo neurological treatment to restore the capacity for moral responsibility." As discourses in neurolaw are already indicating, such scenarios may not remain as fictional as they once seemed [6]. But it appears that a forced choice lies ahead: moral responsibility is either "in the brain" or it is not. Criminal law and legal theory require consistency and try to eliminate confusion. And many other civic institutions, social structures, and cultural frameworks will encounter conflicting interpretations of new neuroS/T. If and when neuroethical consultation is sought, will it be able to speak with one voice?

One might think that the aforementioned kinds of confusing scenarios would be preventable, or at least manageable, if neuroethics is steered in a less naturalistic direction. Assertions that "We are not just our brains!" have an appealing clarity. Disparaging labels for an excessive fixation upon brain functions now include "neurocentrism" and "neuroessentialism" to join the oft-heard charges of "reductionism" and "scientism" [7]. Such labels conceal more than they expose. How does a blanket rejection of scientific reductionism enlighten legal theory about utilizing empirical evidence that adjusting neurological functioning in a brain region actually makes a person less indifferent to hurting other people? How does a scornful repudiation of neuroessentializing illuminate a better definition of moral responsibility, while societies dispute different conceptions of culpability? Deeper philosophical investigations are evidently necessary.

3. Naturalistic and non-naturalistic neuroethics

The counterpart to naturalism would presumably be nonnaturalism, as a catch-all classification. Any alternative to naturalism sets up its opposition by pointing out selected matters that are (allegedly) unaccounted for and left inexplicable, by the resources of naturalism. A nonnaturalistic neuroethics therefore is a neuroethical approach taking the view that authentic moral responsibility and moral decision-making are matters requiring something unnatural about human beings. As unnatural, that feature cannot be generated or directly affected by natural causes, although natural causes may be able to interfere with human capacities (e.g., "free will" is held to be necessary for moral responsibility). In addition, a nonnaturalistic neuroethics would hold that authentic moral responsibility and moral deeds must meet normative standards that remain independent of physiological/neurological/cognitive processes, although such processes can help explain human behaviors (e.g., "ethical rules" must prevail as normatively binding).

In sum, nonnaturalistic neuroethics rejects what it takes to be the opposed position of "naturalistic neuroethics" and the neuro-reductionism and ethical naturalism which naturalistic neuroethics could foster. Such a nonnaturalistic perspective has its own distinctive stance on the two tasks assigned to neuroethics. For nonnaturalistic neuroethics, psychological matters needed for one's moral capacity and moral conduct cannot be explained by any amount of information about the structures and functions of brains; and ethical norms needed for judging someone's morality cannot be grounded by any amount of information from biology or neurology. Neuroscientific reductions or replacements of moral capacity are severely questioned (NB: for a current survey, see [8]), and attempts to ground ethics directly upon nature have long been scrutinized (a recent analysis is offered by [9]).

At this stage, we make our urgent plea for a philosophical pause, before the paired tasks of neuroethics proceed toward a contested divorce, and false dichotomies compel differing worldviews to collide. Although it is the case that "neuro" was hitched to "ethics" with the sort of haste that intellectual fads display, no such mistake was made with "neuroethics." Rather, the true mistake is to presume that each component rests upon a basis that is independent from the other. Philosophy, even naturalistic philosophy, does not so presume, which receives our elaboration in what follows. We remain convinced that the "neuro" and the "ethical" can be closely related and their grounds should be somewhat integrated. We provocatively raise the question of "Naturalizing Neuroethics?" not to advocate for that one-sided agenda, or to instigate counter-responses from naturalism's adversaries, but rather to point the way to a conciliatory philosophical setting that is broader than both sides.

Physician-philosopher Henk ten Have has recounted how the central tasks of any philosophy involve metaphysical, epistemological, anthropological, and ethical domains [10]. Naturalism is no exception. Naturalism, as a philosophical worldview, cannot avoid a metaphysical perspective about what counts as real. For naturalism, the universe, as it is empirically experienced and known, represents phenomena of nature, which are accessible for inquiry. On this view, the tools and methods of science—inclusive of those exploring and demonstrating how organisms arise, exist, and interact with each other and their ecologies—are applicable to the universe, and they are able (at least in the long run) to reveal the nature of anything accessible by inquiry.

To be sure, practicalities limit what can be investigated and understood, especially at the outer bounds of size and scale. The epistemic basis of naturalistic understanding, while ever-widening from the minute to the massive, has to respect constraints of technologies and techniques (i.e., the tools) that humans develop and employ to define what is known and can be known. From such capabilities and constraints arise hypotheses and theories. Through methods of observation, evaluation, and corroboration, hypotheses conjoin currently accepted facts and established physical laws to develop theories: well-substantiated, valid explanations of some aspect(s) of the natural world. Common definitions apply:

> *Fact: In science, an observation that has been repeatedly confirmed and for all practical purposes is accepted as "true." Truth in science, however, is never final, and what is accepted as a fact today may be modified or even discarded tomorrow.*
>
> *Hypothesis: A tentative statement about the natural world leading to deductions that can be tested. If the deductions are verified, it becomes more probable that the hypothesis is correct. If the deductions are incorrect, the original hypothesis can be abandoned or modified. Hypotheses can be used to build more complex inferences and explanations.*
>
> *Law: A descriptive generalization about how some aspect of the natural world behaves under stated circumstances.*
>
> *Theory: In science, a well-substantiated explanation of some aspect of the natural world that can incorporate facts, laws, inferences, and tested hypotheses* ([11], 2).

Humans engage in their empirical inquiries with investigational and decisional tools they implement and put acquired knowledge (information, understandings, meanings) and invented technologies to use for other human enterprises. Everything about science is thoroughly human in embodiment as well as in intellect. Science (qua *Scientia*: knowing, and epistemic means and methods at hand),

no less than technology (qua *Techne-logos*: an accounting of tool development and use), falls entirely within the range, and limitations, of human activity in general. To examine what science does is to study ways that humanity lives. Humans use science and its tools for human endeavors: of comprehension, articulation, interaction with the world, survival, competition, cooperation, and flourishing. Examining, explaining, and proposing how humans enact and implement science include epistemic matters, but they all instantiate the anthropological domain.

Moreover, as Thomas Kuhn, Bruno Latour, and other philosophers and historians of science have elucidated, human ways of life and thought are able to influence and impact each other (for overviews, consult [12, 13]). Because science is a human endeavor, its conduct and employment render it amenable to interpretations and redirections based upon a worldview or philosophy, and/or on cultural tenets and traditional beliefs, which both reflect and foster particular sociocultural ideas, norms, and mores. As philosopher and cognitive scientist Daniel Dennett points out, there is no "philosophy-free" science, "only science whose philosophical baggage is taken on board without examination" ([14], 21). Furthermore, since science is part of the human drama of life, it cannot help but manifest an ethical dimension. Human enterprises pursue ends and defined "good(s)" which are taken to be valuable for something and someone, and thus the ethical domain is engaged.

For naturalism, or any other worldview, the "natural" cannot be very distant or detached from the "human" and the "ethical." That relationship works both conceptually and pragmatically. Neuroethics is no exception, and indeed, it should exemplify that kind of relationship. If and when the "nature" of moral meanings, decisions, and actions are understood in connection with "neural" matters, *and* the nature of brain operations are understood in relation with meaningfully "moral" behaviors, then we can ascertain that the "neuro" is placed securely in "neuroethics" [15].

Can so much "neuro" for neuroethics be trusted? Nonnaturalistic neuroethics lacks that confidence. However, neuroscience cannot dictate what counts as morality and moral cognition, on scientific grounds alone. The neuroscience of morality cannot be scientifically conducted without guidance from social understandings of morality. Scientists premise inquiries into "moral" brain functioning upon ethical views about what shall count as moral situations, moral thinking, moral decisions, and moral values. No amount of cognitive neuroscience and neurology, on their own, could determine what counts as a moral emotion, value, or belief had by any subject. Nor do any of those fields, by themselves, identify the occurrence of a moral decision among the innumerable brain processes happening at any moment. Any perusal of current literature from those fields will illustrate such scientific modesty, independent of conclusions that researchers themselves happen to make about moral cognition (Ample citations to that body of literature are provided by [16–18]). A fuller discussion of neural processes involved in moral cognition, decision-making, and action is beyond the scope of this chapter, but the reader is referred to references cited above.

This methodological point deserves some additional expansion. Exploratory experiments proceed as a human subject (an encultured person, to be specific), who is told what to think about, is asked for a judgment about a certain situation, or the subject is watched for some specific type of conduct, etc., so that experimenters know when morality (among numerous matters for one's attention) has some relation to ongoing cognitive processes. For example, Keith Yoder and Jean Decety survey key brain regions involved with the neuroscience of morality in this manner:

> *Converging evidence from functional neuroimaging studies and neurological observations indicates that the same regions implicated in social decision-making play*

> *important specific roles in morality. Specifically, a set of interconnected regions encompassing the vmPFC, OFC, amygdala, TPJ, ACC, aINS, PCC, and dlPFC are reliably engaged across tasks which involve explicit or implicit evaluations of morally-laden stimuli, regardless of whether the outcome of an action affects the participants directly or another individual* ([19], 285).

Neuroscientific terms predominate, yet key conditioning factors—such as "morally-laden stimuli"—are already deemed by experimenters to be *moral* prior to peering into the brain. In general, unless conditions are amenable to moral sensitivity and judgment, and a person could be mentally oriented under those conditions toward possible moral behaviors, nothing about that person's brain could be interpreted as *moral* cognition [20]. Brains are not examined for signs of moral cognition, while subjects are focused on preparing a dinner meal or operating a lawn mower, unless some distinctively moral feature were added, and that cannot be added by brain science alone. Nevertheless, neuroethics would lack vital content and credibility without consulting neuroscience, so we believe our call for "no neuroethics without neuroscience" to be a sensible demand [21].

In short, epistemic, anthropological, and ethical frameworks together transmute a neurological assessment of brain activity into a neuroethical assessment of moral competency and performance. These methodological considerations lend reassurance that our approach does not conceal a "neuro"-reductionist or essentialist agenda. The discoveries of empirical relationships, stable connections, cause-effect patterns, and conditioning factors among observable events are the very opposite of concluding that some of those matters are unreal or "really" something else entirely. As an illustration, if two observed matters are empirically correlatable, they both remain just as real. References to neural correlates of psychological events, or to neurological events preceding and preparing behaviors, are not covert concessions to reductionism (see, e.g., [22, 23]). Neuroethics pursued in light of well-confirmed neuroscientific discoveries is just well-informed neuroethics, not a neuroethics already co-opted by a metaphysical worldview.

We have also endorsed a call for "no neuroscience without neuroethics" [21, 24], to support an agenda already promoting the development and impact of neuroethics. Yet neuroethics has characteristically been equivocal at best, and at worst mute (if not blind), about the corresponding call for "no neuroethics without neuroscience." Ethical rules and principles ready-made for application to neuroethical issues relieve philosophical intercessions from the burden of incorporating cognitive and neuroscientific information about moral judgment and action. A *philosophical* neuroethics can do better than that. The dictum that "Is cannot imply an Ought" appeals to positivists, yet the converse notion that "Ought cannot supply an Is" is too simplistic and pessimistic as well. What is devoutly pursued with ethical devotion must make its material difference in human practices and psychological operations, or else it has no footing or effectiveness (anywhere) in the natural world.

To this point of our argument, we have defended our view that reflective philosophical approaches to neuroethics should acknowledge a "natural-ethical" continuity and entanglement. Due recognition of that relationship has not been naturalism's insight alone. After all, idealisms, phenomenologies, existentialisms, and theologies have perennially sought to integrate the ideal and the real. Perhaps answering the question, "Which philosophy or philosophies best undergirds neuroethics?" need not choose one front-runner, if enough shared philosophical ground could be found.

Philosophical anthropology, as the fulcrum point midway between metaphysics and ethics, is ideally situated to stimulate realistic reflections on the capacity of various cultural constructs and practices to ground a global neuroethics. The

plurality displayed by ethics around the world is the key to forging an applicable ethics for humanity. Since it is naturally human for societies to develop and uphold their cultural ethos in diverse ways, all ethics is undeniably human in aspiration and service. Our search for a universally relevant neuroethics, securely grounded in humanity's capacities and endeavors, has brought us to the question of cultural diversity. How might neuroethics comport with, and best serve, the varied world-views, wisdom traditions, and philosophies exemplified in the global heterogeneity of the twenty-first century?

To begin with, neuroethics in definition and practice should not be viewed as only another subfield of applied ethics, despite certain advantages to doing so. If neuroethics were entirely subsumed under philosophical ethics, then its supervision by philosophy would bind neuroethics to the humanities, where human values can be insulated from scientific encroachment and the "naturalistic fallacy." That security might relieve anxieties about dissolving what is most "human" into the biological realm. However, neuroethics has already acquired and apprehended far too much from the behavioral and brain sciences to expect and propose that human values float freely and apart from individual and groups' plans, pursuits, and practices. We would hope that dismissing the scientific study of human beings and retreating into idealistic enclaves should not be the destiny of neuroethics.

Perhaps neuroethics is instead destined to play an ancillary role, supporting the lead taken by the brain sciences. Ethics, to be most realistic in nature, would presumably be discerned somewhere in the cognitive processes generating the actual moral judgments that humans make in the course of living (more or less) moral lives. That would allow neuroethics to appeal to ethical standards pre-approved by the embodied human brains of people trying to be moral in the first place, so neuroethics gets subsumed under the "neuroscience of morality." But that leaves moral psychology torn between two masters: shall it conform to strictures set by neuroscience (such as the eliminationist abandonment of much moral vocabulary as fictional folk psychology), or shall it remain loyal to one or another ethical theory (e.g., by taking the dualist route of awarding moral thinking an ontological status among other brain processes). Is neuroethics similarly caught between serving two masters?

Treating ethics as something that is materially instantiated in the brain, as many academic writings on neuroethics expect, is only a half-way measure that contorts both ethics and science. Crafting just-so interpretations "showing" how the brain does what this or that ethical theory requires amounts to committing the naturalistic fallacy in reverse! Far too much work on behalf of one preferred ethical theory or another has to be put into designing experiments and selectively interpreting results, from either experimental psychology or imaging neuroscience, to reasonably conclude that any ethical theory enjoys an obvious empirical advantage. Uniquely *moral* sentiments (and moral values, etc.) have no singular cerebral locale, and they are not ready-made for guiding purely *moral* judgments somewhere in the brain [8, 15, 25].

However, a third option beckons, presented by philosophical anthropology. Like neurophilosophy, and its revisions of philosophical issues with a due measure of scientific information, neuroethics could collaborate with the sciences in a pragmatic and judicious manner. Neuroethics can be suitably naturalistic with respect to advances in behavioral and brain sciences, without descending into a naturalistic submission to science. On that basis, then—and only then—will human "ethics" be fully aligned with "neuroethics."

Here, proponents of nonnaturalistic neuroethics may intercede, observing that their protection of moral values surely merits considerable anthropological validity. To reiterate, a nonnaturalistic neuroethics follows the lead of privileged

nonscientific or anti-scientific ideas about why and how people are moral/immoral, and it conforms to traditional moral norms endorsed by one culture or another. What could be more human? We cannot disagree, having drawn attention to the way that humanity flourishes through many diverse cultures.

However, such laudable diversity compels nonnaturalistic neuroethics to subdivide into numerous neuroethics, each beholden to one or another ethical tradition that seems as "natural" for human beings as any. What they retain in common is their reluctance to accept neuroscientific claims about human morality without ample reinterpretation and amendment in light of their tradition(s). And in this way, each nonnaturalistic neuroethics will tend to display a contradictory stance toward brain science: while denying that neurological evidence could count against preferred moral judgments, they expect brain evidence to somehow support the naturality of those judgments. To conceal that tension, a nonnaturalistic neuroethics may appeal to two allies: moral philosophy (about what morality really is) and ethical theory (about principles grounding moral norms). A suitably parochial moral philosophy and a parochial ethical theory, sharing a sociocultural basis, can lend support a nonnaturalistic neuroethics. No admission of relativism will be forthcoming, as they purport to address what is genuinely moral for humanity.

A concern for human morality is admirable, yet nonnaturalistic neuroethics is not alone in its anthropological focus. Naturalistic neuroethics, by definition, will not follow ideas about humanity and human morality that prove incompatible with the behavioral, biological, and brain sciences. Inconsistency cannot be ruled out in advance. Naturalistic neuroethics is not silenced by claims to the effect that "What we think about morality cannot be placed in doubt by anything brains are doing." For a naturalistic neuroethics, what human brains are really doing (and not doing) can expose mistaken ideas about how people are able (or fail) to behave morally.

Human capacities to learn morality and incorporate moral norms into daily conduct are studied closely by developmental, social, and moral psychology, and cultural anthropology can be coordinated with those fields [26]. As for cognitive and social neuroscience (i.e., what could be considered "neuroscience of moral cognition and behavior"), their role here is adjunct to psychology, since they presuppose that experimental subjects are sometimes thinking about, and occasionally performing, moral behaviors. Moral philosophy should cooperate with the behavioral sciences as well: moral philosophizing that ignores anthropology and psychology lacks sufficient content, devolving instead into either rationalism or sentimentalism.

4. Integrative, realistic, and neuroethics

Naturalistic neuroethics, heeding moral anthropology and psychology, finds that only socialized and encultured brains enact moral practices. As previously explained, no answer to "What is morality?" or "Who is moral?" will arrive solely from studying neural functioning and brain processes. A "naturalistic" stance for neuroethics should affirm, as firmly as nonnaturalistic neuroethics, that ethics will not be determined by brain sciences, and narrow "neuro-reductionism" will not replace moral philosophy or dictate neuroethics. Nevertheless, what human brains are really doing (and not doing) sets factual bounds to pondering how people are able (or fail) to behave morally.

Nonnaturalistic neuroethics would be best served by heeding and upholding the realistic advice that ethical theorizing should attend to actual moral capacities and practical methods able to improve them. Naturalistic neuroethics has the same

boundaries, attending to humanity as it has biologically evolved, and morality as actually practiced by humanity. Only socialized and encultured individuals (with their embodied brains) understand and enact moral practices; hence there is no such thing as a culture-free morality, unstructured by historical tradition embedded in some society or another. Any neuroethics relies on ethics and cannot create it. Ethics displays considerable variation with regard to concrete moral norms, but it never wavers from its primary devotion to moral agency and the moral subject, without which morality would be an empty gesture. It is ethics itself, a thoroughly human ethics that requires neuroethics to protect the human capacity for personal identity, dignity, and moral responsibility. And it is ethics that demands neuroethics to accordingly apply the highest ideals and principles for evaluating neuroS/T. Thus, the answer to the question, "From where does neuroethics get its ethics?", can only be an anthropological answer: from humanity itself.

In comparison, nonnatural neuroethics cannot be as faithful to humanity as a whole. Fixations upon unnatural psychology and transcendent ethics only seem to satisfy metaphysical quests for permanence and certainty. Epistemic tensions tend to render any nonnatural neuroethics apart. Neuroscience cannot be conducted or trusted without reinterpretation from unscientific stands, while allies from moral philosophy and ethical theory are culture-bound and somewhat resistant to revision. Anthropological problems will also mount: human moral capacities are misconceived or minimized in contrast with idealized moral expectations, while the effects of neuroS/T interventions on moral behavior are regarded as mysterious or tenuous. Finally, when it comes to practical ethics, nonnatural neuroethics is bereft of resources for constructive ethical theorizing about workable ways to adjust and improve moral conduct.

A nonnatural neuroethics need not exalt metaphysics to the detriment of epistemology, anthropology, and ethics. A cultural heritage or religious tradition can avoid the problems inherent to a staunchly nonnatural neuroethics. Abandoning ethical principles and embracing reductionism is not necessary; indeed, naturalistic neuroethics is admittedly metaphysical about nature yet it need not, and should not, devolve into value-free physicalism. Even if metaphysical insights distinguish the worldview of a religious tradition, scientific insights into the whole human being and the human capacity for moral agency can be accepted and implemented for worthy ethical goals. As for naturalistic neuroethics, it must never lose sight of the personal self that bears moral worth and pursues moral ends. Here, it is important to assert that neuroscience—and neuroethics—must appreciate the functions of brains that are embodied in organisms that are embedded in their ecologies, inclusive of culture and religious traditions and practices [27]. In this way, naturalistic neuroethics will be indebted to ethical wisdom conveyed by cultural and religious heritages.

From this broader vantage point, the chasm separating naturalistic and nonnaturalistic neuroethics no longer seems so wide. With anthropology and ethics leading this approach, a closer convergence is coming into view. We can now confess that the initial (and admittedly artificial) dichotomy that we erected between "naturalistic" and "nonnatural" neuroethics had to collapse. The shared humanistic basis to any ethical neuroethics, grounded in humanity and its moral ways, brings ethics and science into conceptual and practical coordination:

> *Only socialized and encultured brains understand and enact morality. No science has a basis for inquiries or judgments about morality apart from this human arena of life.*
>
> *Moral values and norms are instilled and perpetuated through one or another culturally embedded heritage. No science is inquiring into anything about morality outside of these ongoing practices.*

Cognitive science and neuroscience cannot independently understand human moral capacities. Alleged discoveries about moral cognition from brain science alone have, in fact, tacitly presumed psychological or philosophical frameworks.

Developmental, social, and moral psychology is best positioned to comprehend how people participate in the moral practices of their societies. Brain sciences yield adjunct inquiries to moral capacities by presuming frameworks from the behavioral sciences.

The behavioral and brain sciences are discovering the cognitive functions and neurological processes permitting moral behaviors. What human brains are really doing (and not doing) sets factual bounds to pondering how people are able (or fail) to behave morally.

Ethics offers bridges between moral practices that humans promulgate and desired moral ends worthy of pursuit. Ethics should deal with actual moral capacities and practical methods of improving them.

Effective means of understanding and improving real-world moral conduct are the practical tools in service of meeting moral standards and realizing ethical ends. Imagined threats to morality from nature and causality unwisely thwart motives to make a more moral world.

So long as humanity as a whole is an objective of both scientific study and ethical interest, then neuroethics can be cohesive and complete. "Naturalizing" neuroethics actually names no urgently needed project. As unwarranted worries over reductionism subside, "nonnaturalistic" neuroethics only names a reactionary agenda without a real opponent.

5. Conclusion

We posit that the truly urgent project facing neuroethics today is this query: *Given the cultural heterogeneity characterizing the global stage where advanced neuroS/T is emerging, how should neuroethics wisely learn from, and lend advice to, humanity's worldviews, wisdom traditions, and philosophies?* Elsewhere we have urged that a cosmopolitan approach to ethics can elicit deliberations converging on useful principles [1, 28]. Here, we add our warning against emphasizing metaphysical differences or moral disagreements at the expense of our shared humanity, so that "neuro-bio-ethics" has a consolidated foundation and consists of more than just a hybrid term [22, 29]. A human-centered and person-oriented neuroethics will prove capable of assessing how neuroscience is exploring and affecting cognition, emotion, and behavior (inclusive of moral conduct), while upholding ethics to guide the application of neuroS/T as an endeavor seeking the good for humanity.

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Section 3

Neuro-Ethical Praxis Amidst Pluralistic Value Sourcing

Chapter 4

Terminality Advance Directives and Nursing Practice in Brazil: Bioethical Issues

Jacqueline Resende Boaventura, Juliana Dias Reis Pessalacia, Luciana Ferreira Da Silva, Ana Paula Da Silva, Larissa Da Silva Barcelos, Carlos Eduardo Pereira Furlani and Adriano Menis Ferreira

Abstract

Advance directives (ADs) are understood as the act of deciding what care the patient wants to receive in the period before death. Preserving the patient's autonomy by choosing his care guarantees human dignity during the process of dying. In Brazil, life expectancy and supportive technologies have increased, leading to growth of the number of terminally ill patients. However, there is still no legislation regulating ADs causing legal uncertainty in health professionals. Nursing professionals have the support of the Federal Nursing Council to respect the ADs, but, because it is an issue little explored, nursing professionals do not feel safe in the use of ADs, and changes in the curricula of the undergraduate courses in nursing are extremely needed, ensuring that patients have their wishes met during the dying process. Thus, this chapter deals with bioethical and legal issues involving ADs and nursing in the Brazilian context, proposing to deepen reflection and criticism on the issue and subsidies for decision-making.

Keywords: advance directives, right to die, palliative care, bioethics, nursing

1. Introduction

Life in the society is shaped by a set of principles, values, and concepts that determine approval or disapproval judgments in the interpersonal relationships and actions of the individuals. In this context, ethics seeks to reflect and understand the presuppositions of morality, aimed at achieving the best result for people and society [1].

However, this concept was expanded through scientific and technological advances, emerging bioethics in the 1970s, which means "ethics of life" in the literal sense. Bioethics proposes the dialog between the biological and human sciences. In 1971, the oncologist and university professor Van Rensselaer Potter published the book *Bioethics: A Bridge to the Future*, placing bioethics as necessary to ensure human survival in the accelerated civilization development. He reported that knowledge has been acquired at a speed far greater than the capacity and ability to know what to do with it [2].

Bioethics needs to be considered not only in the research and development area but also in interprofessional relationships in health, not limiting the analysis of such relationships only to deontological codes. In this sense, the North American principalist model is shown as a good ally in directing actions, reflections, and decisions of health professionals [1].

The beneficence, non-maleficence, autonomy, and justice principles can be applied prima facie in health decision-making. Beneficence suggests the need to do good, requiring professionals' knowledge and skills to distinguish which procedures and practices are beneficial and which can harm. Non-maleficence is not exposing the patient to risk situations, minimizing damages, and seeking other alternatives. Autonomy represents the patient's right to decide what is done to his body and health, based on his life purpose, principles, and creed. The principle of justice is the social duties and benefits, which are contemplated and guaranteed in the Federal Constitution of 1988 and in the Organic Law of Health (Law 8080/90) [3].

In different healthcare settings, terminality is a topic full of ethical dilemmas that require decision-making by the professional who is always trying to overcome death and interfere in different ways in this process. As death is still a "taboo" in our society, when it occurs in health services, it becomes more evident as a medical failure than the simple understanding of the natural course of life, leading to bioethical discussions and problems [3].

Facing the current conjuncture of advances in technological development for the extension of life, death previously seen naturally and as part of the process of human finitude is now tried to be avoided. At present the usefulness of life support therapies is questioned, such as: When to interrupt or maintain life without hurting the principles of bioethics? [4].

The problems revealed with end-of-life care express the importance of intensifying the debate about the imminence of death and human terminality, analyzing the progress of the social behaviors and the ethical precepts of health professionals in palliative care [5].

In this context, the theme of the advance directives (ADs) has been discussed in Brazil, which consists of deciding what care to receive in the period before death, ensuring to the patient more dignity and quality in this process. Refusing unnecessary interventions, pain and suffering relief, and home care around the family rather than hospital isolation are debatable issues that express the patient's autonomy.

Therefore, legal issues of effectiveness of the social rights and the affirmation if they contemplate the fundamental rights of the constitutional legal order expressed by the Democratic State of Law will be addressed, with due guarantees and legal safeguards of the existential minimum or the possible reserve, accessibility to justice as a common good.

Thus, this chapter addresses the bioethical and legal issues involving ADs and nursing in the Brazilian context, proposing a deepened reflection and criticism on the topic and subsidies for decision-making involving the nursing professional.

2. Advance directives and nursing

Brazil is following the world trend with a significant increase in the population over 65 years old, from 4.1% in 1991 to 7.4% in 2010. In 2020, it is assumed that Brazil will be sixth worldwide, considering the older adult population [6].

In this context, the increase in life expectancy and in the supportive technologies has led to a substantial increase of terminally ill patients. During the terminality of life, the individual is faced with unusual events and arduous decisions regarding

health care, including communication of bad news, palliative care, advance directives (living will), order of not resuscitating, and dysthanasia [7].

Little is prepared for death. Even the health professionals are prepared to seek only life above all, putting death as something to be defeated [8]. In the situations where the medical behaviors are exhausted, the palliative care appears to offer better assistance to the patient and to minimize the suffering [9].

Biologically, death is a consequence of the vital functions, cardiac and respiratory end, and over the years, even feared, it has been postponed through the use of various technologies. Cardiopulmonary resuscitation (CPR) in some cases keeps the heart pumped only for a short period turning into an invasive and traumatic experience and sometimes depriving the patient of their choice of death that can lead to a loss of dignity and prolongation of suffering [10, 11]. Thus, the question is: What benefits are added to the state of human existence in which the person does not establish more relationships with other people, as in the case of the state of coma? Why increase the days of life, concomitantly, to the affliction of the patient and their relatives? [3].

Under some conditions, the decision to maintain life at any cost must be taken by the patient, because although death is relatively close, he is still alive and conscious, and his wishes must be respected as far as possible [12]. The act of deciding what care to receive in the period before his death guarantees more dignity during the process of dying [13] since the bioethical principle of autonomy can interfere, question, and choose procedures or treatments [3].

In the meantime, it is worth noting that the principle of autonomy foresees that decision-makers are rational agents with appropriate cognitive conditions for the understanding of their own interests and without any external controlling influences. Thus, the obligation to respect the autonomy of the patient can exceed the duty of beneficence of doctors and health professionals, if rationality and knowledge of the patient's situation can be confirmed [14].

Also a greater vulnerability of the patients with chronic neurological-incapacitating conditions should be considered, such as Parkinsonism or muscular dystrophy. In these cases, it is important to create a formal communication process, from the diagnosis of a serious illness. For neurology patients, the period between the diagnosis and the loss of communication capacity is frequently limited, and the opportunity of effective communication in this period should not be missed [14].

Under the view of humanization, the technical-scientific advance restricts the patient, since health care is directed to attend only biological and physiological aspects. Thus, ADs enable patients to express the subjectivities of their desires and, with dignity, to direct what they expect for their days to the end of life.

These advances have enabled some patients to survive in persistent or minimally conscious vegetative states for decades. In these cases, due to emotional issues, the caregivers opt for care continuity. However, such decisions have impacts on the patient's quality of life and ethical responsibility for the distributive justice of health systems. Doctors are encouraged to make decisions in individual cases since conflicts may be unavoidable. In cases of some conflict, doctors may ask help to nurses as they are professionals who are with patients most of the time, being potential experts of their wishes [14].

Given such conditions, advanced care planning (ACP) strategies have been discussed in India, ensuring that adults at any age or stage of health understand and share their personal values, life goals, and preferences regarding future medical care. In this context, the main responsibilities of neurologists in medical practice in end-of-life care appear in two situations: catastrophic brain injury (CBI) and life-limiting neurological illness (LLNI). Patients with CBI are hospitalized in an altered mental status, and life-sustaining treatments (LST) are often performed

immediately after. Also the difficulties of decision-making for not presenting legislation on the declaration of death by neurological criteria were pointed out, recommending that the medical team makes decisions, in conflicting cases, in consensus with the relatives and other members of the health team [14].

In Brazil, as being a very recent topic, there is little research that explains the ADs and the understandings of health professionals and society on the theme [15].

Currently, the consideration for the patient autonomy is being discussed, as well as the power to express opinions, make decisions, and proceed according to their personal principles and rules [16]. This right is shown in Article 15 of the Civil Code and Articles 22, 23, and 24 of the Code of Medical Ethics (CEM).

In the world context, ADs appeared in the United States in the 1960s and were initially presented by the American Society for Euthanasia in 1967 through the document entitled "Living Will (TV)," in which the individual could register their wishes to cease the medical conceptions of continuity of life [17].

It is suggested that advance care planning initially includes information about the types of life-sustaining treatments available and decisions about the types of treatment that patients would or would not want if they were diagnosed with a life-limiting illness. Afterward, it is necessary to encourage the sharing of personal values by patients and their families, and only then the ADs should be written, expressing what kind of treatment they would like or not if they could not speak for themselves [18].

If the patient does not have the cognitive conditions to decide, it is suggested that the substitute decision-maker meets the following criteria: being able to make a decision, being available and willing to do so, and being legally established as representatives of the patient. In the absence of a legally established representative for decision-making, the next of kin may be considered a substitute [18].

In Brazil, from the juridical point of view, in the current Constitutional Order, principles are considered as guidelines, and unlike the norm that regulates an end, the principle regulates a means, and it is the foundation of any legal system. In the case of ADs, the principles seek to eliminate gaps, offering coherence and harmony to the legal order. Although widely discussed worldwide for years, the ADs were inserted in the national healthcare scenario only in 2012, through Resolution CFM 1995/2012 which guides the medical practice in end-of-life conditions, ensuring patient's self-sufficiency and the preservation of human integrity [19].

According to the CFM, the ADs are characterized as a grouping of wills, clearly expressed by the patients about their treatments and care they want to receive when they are unable to manifest their wishes [19]. This resolution considers the probability of the patient to name a representative so his demands can be met when he can no longer pronounce them [19]. The instruction to interrupt treatments that unnecessarily prolong the life of the patient with a severe or incurable illness allowed to the doctor was already provided for in Resolution CFM 1805 of 2006 [20].

When talking about ADs, it is essential to understand that this is the junction of the Durable Mandate (DM) and TV in a single document [17].

The DM is the patient's indication of one or more attorneys-in-fact to be consulted by the medical team in case of his definitive or momentary impossibility when it is necessary to make a decision on the treatment or not treatment [16]. The TV is a document in which the patient details the treatments and procedures he intend to do or not to do when he is incapacitated to manifest his will, being useful only in cases of terminality [16].

The TV is a legal instrument that enables to certify the domination of the individual in the decisions about his health, having the "good death" as his final purpose [19].

Brazilian doctors still do not have legal support in relation to the ADs. However, they must obey CFM Resolution 1995/2012 [16]. The doctor should transcribe in

medical records the ADs that are formally declared by the patient. If the person in the hospital is not known and if there is no appointed attorney-in-fact, available relatives, or concordance between them, the doctor should refer to the Bioethics Committee of the institution. If there is no committee, the hospital's Ethics Committee or Regional and Federal Council of Medicine needs to document their opinion on ethical confrontations, when considering this measure as indispensable and appropriate [19].

Currently, the Bill 149 of 2018 is in process in the Brazilian Federal Senate, which regulates the advance directives on health treatments. The Article 2, paragraph I of this Bill defines ADs as a "manifestation documented by public deed, without financial content, of the will of the reporting person to receive or not certain medical care or treatment, to be respected when the person can not express his will, freely and autonomously" [21].

Also in Article 3, the Bill proposes that "every greater and capable person has the right to declare in advance, his or her will to receive or not certain medical treatments in the future when being in clinical condition" [20]. Article 5 of this same Bill reports that "advance directives must be met by health professionals and public or private health services, as well as by relatives, legal guardians, and the declarant's representative" [21].

The respect for the independence of the actions related to the ADs is an important benefit for their application, especially in the disease termination, not only for doctors but also for the nurse [22].

ADs are seen by nursing professionals as synonymous with attending to the principle of autonomy of the patient and their relatives, with undeniable character and with inevitable growth [23]. It is an instrument capable of facilitating decision-making on ethical issues related to the end of life [24].

Nursing is recognized as the professional category that plays a primary role in the exercise of the right to self-determination, helping and facilitating patient decision-making, as it is present throughout the death process [25]. When establishing effective and early communication with the hospitalized patient, the nursing team creates a bond of trust between patient and professional that allows the conscious and autonomous exercise of the right to self-determination, ensuring that the patient's wishes and choices are taken into account in situations involving decision-making in terminality [26].

The Code of Ethics of Nursing Professionals [26], in its Article 42, Sole paragraph, describes that the nursing professional must "Respect the person's advance directives regarding the decisions about care and treatment that he or she wishes or not to receive at the moment when he/she is unable to freely and autonomously express his/her wishes."

However, the lack of knowledge of regulations aimed at nursing professionals and the fear of ethical-legal implications interfere with the use of ADs. Faced with this reality and to avoid conflicts, nurses prefer to attend the wishes of family members, even if these wishes are not in accordance with the wishes expressed by the patient [27, 8].

For nursing professionals to feel effectively supported and safe in the use of ADs, it is necessary to include this subject in the curricula of the Nursing Undergraduate Courses, and the dissemination of scientific knowledge should be in agreement with the benefits brought to the patients with their wills met.

Currently, the National Curricular Guidelines of the Nursing Undergraduate Program indicate that nurses' training should cover issues related to the prevention, promotion, healing, and rehabilitation of the health of individuals and the community. Thus, higher education institutions guided by these guidelines offer technical-scientific training that favors therapeutic obstinacy, aiming only at maintaining life at any cost [28].

It is believed that curricular changes, which deepen the ethical debate around issues related to the dying process, are necessary in the training of the nurse since the proximity of the nursing team with the hospitalized patient provides emotional exhaustion, and these professionals feel they are helpless before death. It is necessary that the process of dying be debated within educational institutions, so future nursing professionals understand and respect terminality as a phase present in human existence [23].

Rethinking treatment related to terminal patient care within higher education institutions favors the reduction of difficulties in dealing with the death process and therapeutic obstinacy and providing more humanized care [29].

Thus, it is important that the future nurse be encouraged to know the ADs during the professional training process, to understand its applicability in their clinical practice and to stimulate its use by patients, terminal or not, informing the possibility of construction and the importance of the ADs and presenting the necessary explanations for the elaboration of a document of this nature [28].

3. Conclusion

In Brazil, there is still no legislation that deals with ADs, which makes this topic little debated and diffused among health professionals, more specifically among the professionals of the nursing team.

Guaranteeing the individuals the right to carry out their wills in terminality through the ADs is still not enough since collective work is indispensable and necessary to respect their autonomy and reflections on the cultural actions of professionals' health and family members that determine the paradigm of sustaining life at any cost.

The main challenge found during the dying process is to ensure that in practice, the patient's wishes are met. It is noticeable that the implications and obstacles resulting from the ceaseless transformations of the right to health as a whole are far from over, especially the relationships inherent to the principle of human dignity, individual freedom, and the practices of health professionals.

There is a need to disseminate among nursing professionals the importance of encouraging the free and informed autonomy of patients and of the Federal Nursing Council regulation that supports professionals who respect the ADs of the individuals under their care. The knowledge of the Code of Ethics of Nursing Professionals and the inclusion of ADs in the curricula of Nursing Undergraduate Courses are essential for Brazil to make a positive contribution to this issue.

In view of the current Brazilian health scene, the ADs are characterized as a new subject, and its applicability involves cultural change, family and health professionals' agreement, and an early approach in both undergraduate and care education.

Conflict of interest

We declare there is no conflict of interest in this research.

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Chapter 5

Values-Based Medicine (VsBM) and Evidence-Based Medicine (EBM)

Ahmed Ammar

Abstract

Medical care is a dynamic process to implement and use the most recent technologies, skills, and knowledge to either maintain the good health of people or to treat sick patients. Patients have the right to receive the best possible available treatment. During the course of treatment, the patient's dignity and rights should be respected and never be compromised. A patient's right to be properly treated is one of the fundamental human rights. The healthcare system is responsible for providing efficient and sufficient healthcare facilities and training and continuously educating able medical and paramedical teams. Evidence-based medicine has been popularized in the last 40–50 years in order to raise the standard of medical practice. Medical ethics and values have been associated with medical practice for thousands of years since patients felt the need for treatment. There is no conflict between evidence-based medicine and values-based medicine, as the medical practice should be always preformed within a frame of ethics and respect of patient's values. Observing the principles of values-based medicine became very relevant as multicultural societies are dominant in some countries and hospitals in different corners of the world.

Keywords: values-based medicine, bioethics, patient's rights, education, dignity, history of medical ethics

1. Introduction

Conventional clinical relationships are centered on a triad, consisting of the physician, the patient, and his/her family. Nowadays, individuals in need or seeking medical care, as well as their intimate circle, interact with a great variety of stakeholders and clustered interests. Three important factors contribute to this more complex situation.

The progress of life sciences and technological innovations as well as the development of the health system and the medical-industrial complex create new medical situations and redefine the role of both family members and health professionals.

The potential of modern healthcare, including resuscitation and life-sustaining technologies, their impact on the quality of life, as well as problems of costs and resource allocation in the context of market economies, also redefine the role of family members. This opens a myriad of ethical questions, from coping with frail,

sick, or disabled relatives, over socialization and commercialization of traditional household tasks, to substitute decision-making for minors and patients with diminished autonomy, as well as dealing with end-of-life situations.

The nature of neurosurgical problems forces neurosurgeons to face their patients' families in different emotional situations, frustrated to see good results, disappointed with the outcome, confused, denying, or angry. Neurosurgeons should learn the skill to absorb the first reaction of the patients' family and work with them as one team to help their loved one. The patient's family can play a very positive part in the caregiving team for the patient and may have a great and unreplaceable input for their patient care.

2. Definition and the concept of values-based medicine

Values-based medicine (VsBM) is the concept to ensure that the principles of medical ethics are strictly implemented and observed in every step of a patient's management.

> *Values-based medicine can be defined as "medical practice that aims at maximizing value, specifically desirable or positive value in every step of a patient's medical management".*

The concept of values-based medicine (VsBM) stresses on the fact that patient, patient care, and well-being are the center of care in modern medicine. The treating neurosurgeons, physicians, or healthcare givers should spare no effort to improve their skills, update their knowledge, and learn to use the latest technology in order to provide the best care for the patient. The treating team should have a vision and build up a strategy of management and follow-up of their patients. All these necessary steps should be performed within a frame of values and medical ethics. The treating teams should respect and observe the patient and value and respect the culture of the society. Evidence-based medicine should be considered an important component of values-based medicine [1].The key elements of values-based medicine which, like evidence-based medicine, influence any clinical decisions may be taken for patients' management (**Figure 1**).

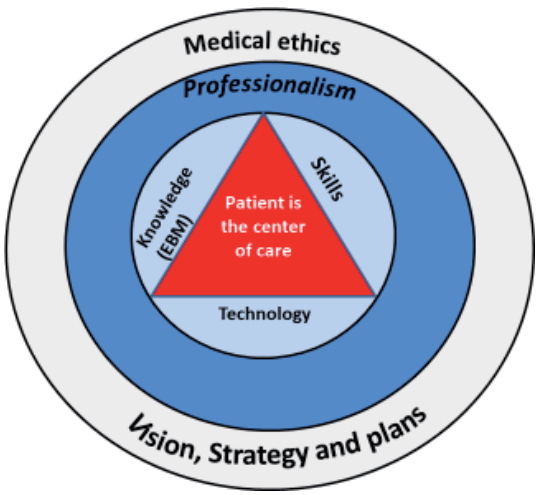

Figure 1.
The concept of values-based medicine (VsBM): patient is the center of care.

3. The principles of medical ethics

Based on the Hippocratic Oath, the main ethical principles were beneficence (do the best for patients) and non-maleficence (do no harm). These two principles were considered to be the fundamental principles of medical ethics for hundreds of years. The principles of medical ethics/bioethics were expanded to include autonomy (patient's right to accept or refuse the method of treatment) and justice. Justice in medicine considers the distribution of healthcare facilities and the access of all patients to these facilities. One of the positive characters of the last and this century is the respect and observation of human rights. Therefore the human rights were manifested clearly in the medical ethics, as the medical ethics expanded again to (a) autonomy, (b) beneficence, (c) non-maleficence, (d) justice, (e) dignity, and (f) truthfulness and honesty. **Figure 2** demonstrates these principles.

3.1 Patients' rights

The respect of patients' rights is one of the main foundations of the concept of values-based medicine. Patients should be considered as partners and share in the process of management. Patients should agree and consent to every step of treatment. Patients have the right to be fairly and properly treated; follow-up should be guaranteed. A patient's privacy, dignity, and confidentiality should be respected. Dignity encompasses a feeling of self-worth and equality. It is paramount that the patient be treated as a person with a disease, rather than a disease that a person has. The patient should also feel he is an equal partner in decision-making, and not just a bystander or subordinate. Patients should be educated and learn about their medical problems, treatment options, and the prognosis. Patients must know who the treating team is, their experiences and qualifications. Patients should have the right to complain in the cases of dissatisfaction about the treatment or lack of communication. Most of these rights are illustrated in **Figure 3**. These fundamental human rights are listed in the WHO recommendation [2] and the World Federation of Neurological Societies as good practice guideline [3].

3.2 The duties and task of the treating teams

The concept of values-based medicine draws the outlines of the duties and tasks of the treating team as illustrated in **Figure 4**. These duties include respecting the

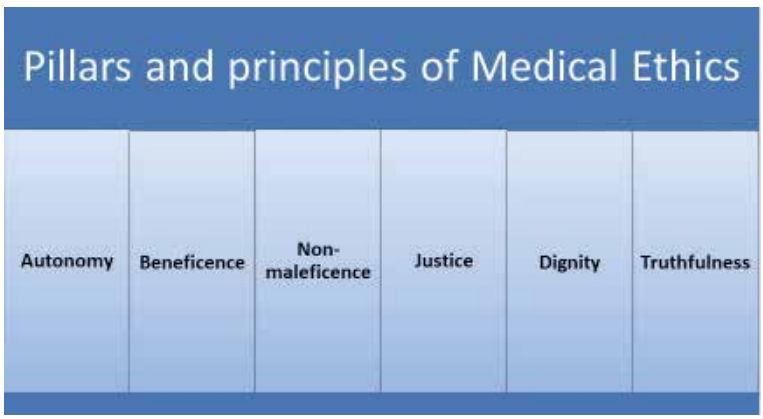

Figure 2.
The principles of medical ethics.

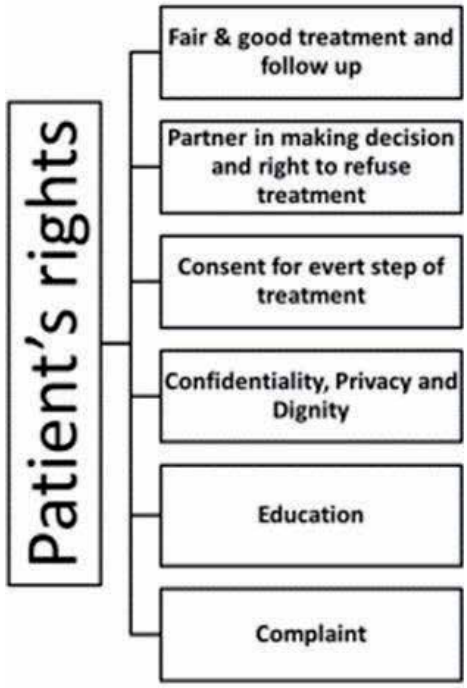

Figure 3.
The Patient's rights.

Figure 4.
The tasks and duties of a medical team.

patient and preserving their dignity. It is the duty of every doctor to improve skills and update the knowledge. Doctors should research answers to previously unanswered medical questions. Doctors should be good citizens and advocate for good health. They should maintain a high level of professionalism at all times.

4. Ethical relativism

Healthcare is considered as a universal human right. Culture, faith, socioeconomic factors, and the perception of the value of the education, work, and status of doctors in differing societies are some of the causes of the variance of healthcare in those societies. That variance cannot be deemed as right or wrong, which led to the study and introduction of ethical relativism. Ethical relativism is the view that there are no ethical standards that are absolutely true and must be applied to the societies, without variance. According to the Relativism Theory, a certain event, attitude, or practice may be considered right, if it is accepted as morally correct by the people of the involved society. The same event or attitude may be considered wrong by a society that does not accept it as morally correct.

Throughout the world, most neurosurgical training programs are designed to produce safe, effective neurosurgeons trained to find evidence for the treatment of different neurosurgical problems [4].

Neurosurgeons are obliged to establish ethical and professional relationships with their patients and to that end, should listen to and be guided by both the patient's medical complaint and their perception of the possible outcomes. It is the duty of neurosurgeons to explain to their patients all the steps of investigation, treatment, operation, and possible outcome.

The neurosurgeon can gain valuable knowledge of the patient's culture and beliefs while discussing the benefits and risks of a particular method of management during the course of obtaining informed consent. This knowledge and exchange of information assist in gaining the patient's respect and trust and compliance for both the agreed-upon treatment and its follow-up. Ethical informed consent requires that autonomy and beneficence are applied in equal measure. In applying beneficence, at the expense of autonomy, neurosurgeons may cause irreparable psychological damage [5–7] . Pressure or influence for a particular course of treatment can never be considered ethical, because, although it may be applying the principle of beneficence, it is at the expense of autonomy.

5. Evidence-based medicine (EBM) and values-based medicine (VsBM)/ EBM and VsBM

5.1 What is medical evidence?

An "evidence" is considered as evidence according to data of a particular cohort study under particular condition of some patient group somewhere. Several scholars and ethicists have raised concern about using the stereotype of evidence to promote a chosen type of therapy or surgery [8]. This attitude may cause bias in selecting evidence to justify certain methods of treatment.

Ross defined the clinical evidence as "In essence, evidence—narrowly defined or not—is a provisional departure point in the consideration of whether or not a particular course of action is to be taken in any clinical context." [9] This definition directly links the evidence to its application but not to the strength, validity, and reliability of the source of that evidence.

5.2 Evidence-based medicine: definitions and impact on medical practice

The introduction of evidence-based medicine 40–50 years ago had a great impact on medical practice almost everywhere. That concept became very popular in a very short time. The main reason being that it offers a strong foundation for the justification of decision-making in the course of management of clinical cases. The evidence-based medicine was defined by El Kayaly et al. as "Evidence-based clinical medicine can be seen as the conscious incorporation of the best evidence that is currently available into daily clinical practice covering prevention, diagnostics, clinical assessments, treatments and patient-centered care" [10]. The implementation of the concept of EBM is significantly helpful and challenging for many practitioners for several reasons such as:

a. EBM aims to manage uncertainty regarding the short- and long-term outcome of management of certain cases. However, this aim cannot be always achieved.

b. From the physicians' perspective, the conscious belief of the treating team that the best evidence and recommended method of a case management is followed has a definitely positive impact on the treating team and increases their confidence about the line of treatment they decided to choose.

c. In the cases when good and suitable evidence are not found or not agreed about, the integration of the principles of values-based medicine is a must.

d. From the patients' perspective, knowing that the course of management offered to them is supported by good evidence helps the patient and his family to accept that method of treatment. The patient's perception of receiving treatment according to EBM has good psychological impact.

e. In the cases of medical litigation or argument, the documents of the best evidence have an important value to balance the argument. EBM documents should have an important value in a court of law.

f. EBM has also important educational values as it challenges all the practitioners to continuously update their knowledge in the course of their striving to find the best evidence. It definitely promotes the practitioners' professional development. EBM seeks to inculcate lifelong learning process.

6. Clinical application of EBM: considerations

In daily clinical practice, the application and implementation of EBM simply means that choosing a treatment for a patient is based on the strongest available evidence. However, the concept of EBM does not consider as much, but should consider patient's values and beliefs or other factors such as experiences of the treating team and facilities available at that hospital. Sackett et al. defined EBM as "Evidence-based medicine is the integration of best research evidence with clinical expertise and patient values" [11]. In that definition "Patient values" is not clearly explained in that definition which may refer to what does the patient want? In fact, the implementation of EBM does not generally seek patients sharing in decision-making. The science, practice, and application of EBM do not consider that patient's values, faith, and culture are factors for grading or leveling evidence (hierarchy of evidence). Several studies showed the importance of the patient being a partner in decision-making [12, 13].

7. How evidence is ethically evidence?

Evidence-based medicine has been popularized in the last 30 years and to a certain extent has been considered a good measure of medical practice. However, the use of EBM shows these limitations:

I. Patient preferences and values were not always considered during the decision-making process [7].

II. Limitations in incorporating health-related quality of life (HRQoL) [14] .

III. EBM is based on finding and following the highest-quality evidence. However, in the absence of randomized clinical trials, the veracity of the evidence comes into question.

8. Collecting evidence

Ethically there are a few serious questions regarding presumed evidence collection. Those queries are legitimate as most of the evidence is obtained from the analysis of large data (meta-analysis) which has subsequently inherited all the problems of analyzing the large data of multiple sources. This problem has been discussed by several authors including Dagi [15]. He mentioned "The ethical question is what to do about the data once it has been collected and analyzed. It is ethically important to separate the results of statistical analysis from, for example, [1] statistically significant but clinically irrelevant outcomes, [2] judgments about how data about the set should be applied to specific individuals within the set, [3] the protection of the prerogatives of individual patients in the face of population-based protocols, and [4] the protection of the surgeon's prerogatives in personalizing the treatment of individual patients. The question of what should be done with probabilities and statistics is not statistical in the least: it is entirely a value judgment." Both scientifically and ethically, there is a clear line between what is considered fact and what should be or ought to be. The philosophical debate about is/ought (fact/value) has continued for hundreds of years and remains unsettled. Hume produced what is called Hume's law "From causes which appear similar we expect similar effects. This is the sum of all our experimental conclusions." He recognized as well the "is-ought" controversy. The idea of linking what ought to be to what is, is seriously ethically and clinically challenged.

Randomized controlled studies are the main factors that were used to level validity and strength of evidence. The value of evidence from randomized controlled studies is considered the strongest or best evidence and top leveled and graded as "Grade I Evidence." Evidence obtained from nonrandomized studies is considered as "Grade II Evidence." However, evidence based on valid experiences and thoughts and opinions of distinguished medical and surgical authorities are considered as "Grade III Evidence."

Ethical concerns have been raised about double-blind randomized controlled studies. It has been debated that denying a group of patients (control group), the experimental treatment or method of management believed to be beneficial, is ethically challenged. There is also an ethical issue concerning the validity of evidence which is a result of double-blind randomized controlled studies which were carried out in certain circumstances, homogenous or not subjects, variable controls, and particular role to be used as the base for making decision for treating patients in different circumstances. Therefore, the integration of the best research evidence with clinical expertise and patient values should be carefully and cautiously considered.

There is a very important and distinct difference between the methods and approaches of clinical randomized controlled studies and the methods and approaches to established treatment. In the cases of clinical research, the physician (researcher in that case) and the patient are not standing on the same platform and may not have the same motivation and goals of the treatment. Therefore ideal clinical equipoise may not be achieved in such cases. Clinical equipoise should be carefully observed in any clinical research. The patient-physician relationship is a complex relationship regardless of the circumstances or the status of the patient. The patient has rights which should be and must be respected fully. The treating physician or surgeon should be a partner who has the main task to provide the best available treatment to the patient and share the very same goals with patient to cure the medical illness.

Respecting and observing patient values and quality of life are core to the implementation of VsBM. These principles and values somehow are overlooked by evidence-based medicine [12, 13].

The obtained and presented clinical evidence should not be out of the ethics frame (values-based medicine). The evidence should be valid and applicable in that particular condition, scientifically proven and adherent to the ethical principles and rules. VsBM and EBM should be integrated in daily medical practice and medical research. Ross [9] wrote "attention to evidence, however conceived, is linked to commitment to care. Rather than being seen as distinct spheres, ethics and evidence become part of an integrated whole."

9. Theories of ethics

The core of the concept of values-based medicine is to value the human being's dignity and respect patient's rights and lay a foundation for ethical and meaningful good medical practice. Values-based medicine is an expression of medical ethics, considering patient as the center of care. So the frequent question of the clinician is "what is the best management for that particular patient?" If the uncertainty is the answer, the question should be brought as "which method of management ought to be better for that particular patient?" The answer to this question should be based on both clinical evidence and ethical values. Medical ethics should guide decisions in the daily medical practice. There are several branches of ethics which are normative ethics, applied ethics, descriptive ethics, and metaethics.

9.1 Normative ethics

Normative ethics are ethical theories which highlight what is morally right or wrong in order to lead to proper decision. Normative ethics constitutes/includes/is explained by several ethical theories, including:

a. **Deontological theory**—which suggests that means may justify the ends. Deontological theory considers the moral rights according to observing laws and authorities.

b. **Consequentialist theory**—which suggests the ends justify the means. It is an outcome-based ethic that says the moral right depends on the positive results.

c. **Virtue theory**—this theory's roots go back to Aristotle's which focused on the inherent person more than an analysis of the person's deeds. According to this theory, the characters of individuals or groups prevail.

d. **Ethic of caring theory**—which considers the subjective values is the determining factor to identify what is right and what is wrong. This theory suggests that relationships should be a deciding factor in deciding what is right and wrong.

e. **Ethical intuitionism theory**—which suggests that intuitions may be distorted by not accurate or complete information, prejudice, and bias.

9.2 Applied ethics

Applied ethics may be described as it mandates the professional code of ethics or ethical guidelines for a certain profession such as medical profession or counseling.

9.3 Descriptive ethics

Comparative ethics focus on the beliefs of individuals, what people believe. Descriptive ethics is concerned with what is believed, not what should be believed.

9.4 Meta ethics

This type of ethics is mainly concerned with the ethics itself. Metaethics studies the nature of values.

10. VsBM: professionalism and professional ethics (separatists)

Medical professionalism in this context encompasses all qualities obtained and expressed to conduct or perform tasks and medical duties as described by the governing organization and hospital and as expected by the society.

11. Professional ethics

Professional ethics is the use of knowledge and skills to providing patient care governed by the ethical code of the workplace [16]. It is akin to moving from abstract values to daily behavior of individuals in their workplaces or societies.

Professional ethics (as it is one of the elements of values-based medicine) should observe values and standards of medical professionals and their medical societies, along with the expected behavior of the organizations and hospitals [17]. Medical professionals have to continuously gain and update their knowledge and skills in order to improve their career and consequently the patient's care. Medical researchers strive to find facts either in deductive or inductive ways. That effort should be governed by values and ethics of the patients and patients' culture and beliefs, not purely the eagerness to obtain knowledge or achieve professional goals [9, 18, 19].

12. Code of ethics

The code of medical ethics is general ethical guidelines adopted by medical societies, organizations, and hospitals. The code is mandatory for all medical and paramedical professionals in that organization to strictly observe. The code of ethics is not only for the benefit of patients but also for benefit for the medical and paramedical professionals.

13. Decision-making

Professional decision-making cannot be overemphasized in medicine in general and neurosurgery in particular. The medical professional should be able to balance the principles of values-based medicine within the roles of the governing organization and hospital. This balance is very important to avoid conflicts of patient's values or hospital policies.

The most critical step in patient management is the decision made by the treating team. The correct decision for a particular patient at the right time is the most determinative factor for the outcome of management. Medical decision-making depends on empirical knowledge and rational and analytical thinking. Evidence-based medicine depends on knowledge and accumulated information over rational thinking and individual experiences and to a certain extent ignores the patient's own values. In brief, there are in general two ways of logical thinking in order to make medical decisions, deductive and inductive methods. However, the rapid development of science, discoveries, medical technology, understanding the roots of pathophysiological disorders, and introduction of new treatments should allow for a less tightly constructed and rigid clinical decision. With uncertainty, the increased probability of causing risk, unsure outcome, and treatment of specific problems in a field like neurosurgery, the patient's autonomy and values should be paramount. The concept of values-based medicine which focuses on patient's best care allows more flexibility to adapt any scientific method which may help the patient. Patient and patient values should be part of any management equation.

The patient's family rights should be observed. The engagement of the patient and patient's family in making decisions created what is called "Patient-patient's family-doctor complex relationship." Such relationship is needed not only for the patient's comfort and well-being but also for the treating team to prevent any misconduct and future unnecessary troubles.

14. Ascertain the immediate outcome and long-term prognosis

The nature and pathophysiology of variable types of neurosurgical disorders may not help the neurosurgeons to ascertain an accurate predication of the prognostic outcome for a specific patient. Sometimes predictable answers can be hard to attain. This unfortunately is not rare which complicates the discussion, communication, and the relationship between a medical team and the patient and patient's family. Agonized and apprehensive extremely worried families are eager to hear answers to their painful questions. It is vital to reach the right diagnosis. Right diagnosis is always the fundamental base for management of the patient, however, in pediatric group may not give an accurate predication for long outcome. Usually the families regardless of their age, culture, religion, or race have many very similar nagging and worrying questions regarding the survival and well-being of their loved one.

Effective communication with patients and their families to discuss every step of the management and the prognostic information to the family is very important to create a good relationship and trust between the treating teams and patients and patients' families. The effective communication has profound influence on decisions regarding goals of care and clinical management of the patient, especially when prognostic information is clouded with a confusion of uncertainties [18].

15. Conclusion

Modern medicine may be based on EBM, which is a positive aspect of modern medicine; however, medicine since its inception, thousands of years ago, is based on values. The core of values-based medicine (VsBM) is creating a status to provide the patients the best possible available treatment within a frame of ethics and values which appreciate their culture and keep their dignity. Evidence-based medicine is, and should be, based on ethical and clinical principles which permit the best proven method of management. Values-based medicine and evidence-based medicine are and should be integrated, complementary to each other, not conflicting. The holistic approach to a human who has a disease needs to be treated, not just the disease should be treated. Humanity comes first, always.

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Chapter 6

Dynamic and Static Models of Body-Mind Approaches from Neurobiological Perspectives

Practical Ethics for Researchers and Practitioners in the Medical and Educational Fields

Shoichi Shiota and Michio Nomura

Abstract

Body-mind approaches (e.g., yoga, mindfulness meditation, Pilates method, and cognitive behavior therapy) are commonly used by the public today. However, the comprehensive neurobiological framework of effects of body-mind approaches is unknown. To begin, we discuss the dynamic and static models of each body-mind approaches from neurobiological perspectives, as well as from the standpoint of practical issues. By the dynamic components of body-mind approaches, people enhances meta-cognitive function, and it lead to decreases in avoidance behavior in social aversive context are suggested. On the other hand, it is assumed that static components of body-mind approaches enhance non-reactive monitoring function for baseline of self. Therefore, we discuss the implications of these findings for practitioners and for future research on body-mind researchers. Additionally, this chapter covers the essential ethical guidelines of body-mind approaches within the domain of medical or educational fields.

Keywords: body-mind approaches, psychiatric disorder, dynamic components, static components, resonance effect, meta-cognitive function

1. Introduction

No doctor or medical treatment can be comparable in efficacy to the human feelings of joy and happiness [1]. The variety of feelings we have as humans and our process of recognition make our lives interesting and meaningful. The inter-individual differences in subjective feelings and the processes of recognition are affected by individual differences in our physical function [2]. The human mind comprises both a bottom-up peripheral nervous system and a top-down central nervous system interaction that controls it. For example, playing football or baseball, which are moderate whole-body exercises, creates feelings of happiness. It is thought that this is due to an increase in body temperature, which is the result of an increase in momentum. This

rise in temperature leads to an improvement in autonomic nervous system control through exercising the muscles of the torso and other parts of the body, which we then recognize as positive emotions. Also, when people hear of painful experiences of those close to them (e.g., friends, significant others, family), this affects emotions in a way that makes the listener want to help. Altruistic behavior arises when we perceive changes in own body sensations in social interactions and when we guess the feelings of others. On the other hand, before people speak in public, individuals often have shortened breath and a rapid heartbeat, feelings we understand as being nervous. Subsequently we attempt to relax. Stress in both the workplace and academic situations increases our sympathetic nervous system, long-term stress which is difficult to control is harmful for physical and mental health. According to the World Health Organization, one in three people suffer from some type of psychiatric disorder, a statistic that holds true in many countries around the world. In Japan, the economic loss related to mental illness exceeds seven trillion yen yearly, a number that combines direct and indirect expenses. Psychiatric disorders can be interpreted as abnormalities in bodily functions due to external factors, and a breakdown in basic mental functions. For example, depression and anxiety disorder result in abnormalities in the control of cardiac autonomic nervous system. Also, persons with depression and anxiety disorder have abnormal functional connectivity between the prefrontal cortex and insula when compared to healthy subjects. Recently, there is increased attention to body-mind approaches as effective treatment for psychiatric disorders. However, as in terms of the treatment mechanisms of these body-mind approaches, there has been little discussion of a comprehensive framework from neurobiological perspectives. Therefore, the current paper explores two basic frameworks: (1) a dynamic and static model of body-mind approaches from neurobiological perspectives and (2) basic ethical guidelines of the body-mind approach when practicing in the fields of medical care and education.

2. Body-mind approach

Body-mind approaches (e.g., yoga, mindfulness meditation, Pilates method, and cognitive behavior therapy) are commonly used by the public today [3]. A body-mind approach focuses on the relationships between the brain, mind, body, and behavior, and their effects on health and disease [4]. To begin, we discuss the dynamic and static models of each body-mind approach from neurobiological perspectives, as well as from the standpoint of practical issues (**Figure 1**).

2.1 Theoretical framework and practical evidence of yoga

Yoga is constructed by practices of postures, breathing techniques, and meditation. Many of the elements of yoga that have been adjusted to Western cultures and became more popular in recent years focus on weight reduction through vigorous physical exercise. However, yoga in general not only aims to help people lose weight but also seeks to modulate an individual's physical or mental condition during practice. Previous meta-analysis studies indicated that yoga is an effective intervention for psychiatric disorders [5–7]. Previous studies have demonstrated that yoga improves one's brain functions and cortical thickness, resulting in improvements in attention control, emotional regulation, and meta-cognitive function. Interestingly, it also seems to improve telomere length and autonomic nervous control in both healthy individuals and those with physical ailments [8–16]. These results are interpreted as demonstrating that asana, breathing techniques, and meditation work interactively. Here, we explain the treatment mechanisms of asana, breathing technique, and meditation. We also illustrate the dynamic and static components that work in concert with asana, breathing techniques, and meditation.

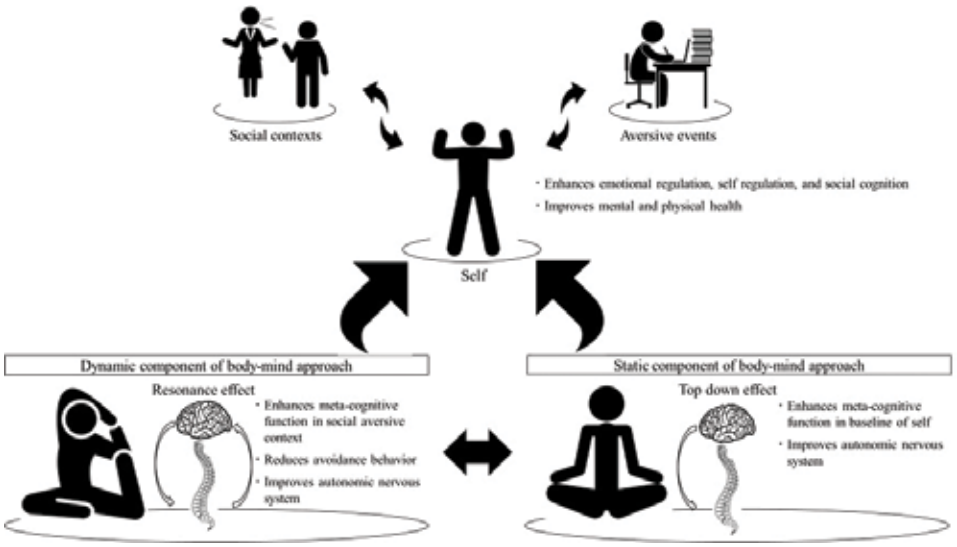

Figure 1.
The dynamic and static model of body-mind approaches.

2.2 The bottom up effect of asana

Asana points to specific physical postures that involve using one's whole body during yoga practice. These physical postures are categorized as standing, seated, and supine postures; they also include forward folds, adopted forward bend, back bends, hip-openers, twists, and inversions [17]. Some practices, such as Ashtanga Yoga, are characterized by quite intense and continuous physical motion with a focus on creating a "flow" of movement by linking one posture to the next. In other practices, such as Hatha Yoga, the movement is less dynamic and the focus is on holding individual postures for a longer period of time. The effect of asana during yoga practice is briefly explained in the following. First, we examine the effects of asana on autonomic nervous system as a result of exercise for the dorsal vertebrae, musculus erector spinae, musculus trapezius, latissimus dorsi muscle, and adductor longus muscle. Previous review articles have indicated that yoga intervention improved autonomic nervous system control for people with psychiatric disorders and individuals with cardiovascular disease [9, 15]. Iyengar yoga, which is characterized by improving toughness and stamina and correct body distortion, has been shown to reduce anxiety, depressive symptoms, anger, neurotic symptoms, and low frequency heart rate variability for people with depression [18]. According to Lakkireddy et al. [19], structured Iyengar yoga decreased anxiety, and depressive symptoms, while improving quality of life, heart rate, and systolic and diastolic blood pressure for individuals with arrhythmia burden. Streeter et al. [20] reported asana practice significantly increased brain GABA levels. Common asana, which includes exercise for the dorsal vertebrae, musculus erector spinae, musculus trapezius, latissimus dorsi muscle, and adductor longus muscle, is included in these studies. For example, the Sun Salutation, the most popular asana, was studied by Steer et al. [20]. It includes exercises for dorsal vertebrae, musculus erector spinae, musculus trapezius, latissimus dorsi muscle, and adductor longus muscle during flow movements. Adhomukhavirasana (modified child posture), which was used Lakkireddy et al. [19], expands the latissimus dorsi muscle and lower back. The latissimus dorsi muscle is related to extension of shoulder joint, and extending this muscle eases deep breathing (abdominal breathing). During Salamba

Sarvangasana, which was used in Shapiro et al. [18], the focus in on individual exercise of the dorsal vertebrae and several muscles (e.g., musculus erector spinae, musculus trapezius, latissimus dorsi muscle, and adductor longus several muscle). We must not disregard the interaction between asana and abdominal breathing; however, from the evidence above, we speculate asana exercise improves autonomic nerve system control which should then lead to the improvement in the symptoms of psychiatric disorders. However, possible side effects of asana exercise should be carefully investigated. Asana is regarded as having bottom up treatment effects during yoga practice.

2.3 Top down effect of breathing techniques

The conscious practice of altering breathing patterns may have a number of different effects depending on the characteristic of the practice [21]. For instance, slow and rhythmic breathing is said to promote a shift to parasympathetic dominance via vagal afferent stimulation with consequent stress reduction [22], whereas more forceful breathing practices may promote sympathetic activation [23]. Voluntary change of breathing patterns can alter emotional states and influence well-being [21, 24, 25]. In fact, a typical autonomic reaction to stressful situations is rapid thoracic breathing, which in turn leads to hyperventilation, altered tidal volume, and hypocapnia [26]. Yoga is a practice that emphasizes linking breath and movement. For example, in Ashtanga Yoga each asana is coupled to a specific breathing rhythm so that the specific breathing technique helps enhance movement. Sudarshan Kriya Yoga is a yoga practice that incorporates powerful breathing, Ujjiay—slow and forced breathing, 3 cycles per minute; Bhastrika—rapid exhalation at 20–30 cycles per minute; Sudarshan Kriya—rhythmic, cyclical breathing of slow, medium, fast cycles [21]. In the practice of yoga, various breathing methods such as chest respiration, which increases the sympathetic nervous system, and abdominal breathing, which increases the parasympathetic nervous system are used. Previous studies have demonstrated that yoga breathing techniques when used alone improved symptoms in patients with psychiatric disorders and healthy elderly individuals [27–29]. Santaella et al. [28] reported that the Sudarshan Kriya Yoga breathing technique significantly improves maximum expiratory and inspiratory pressures of pulmonary function, and significantly decreases low component and low frequency/high frequency ratio (marker of sympathovagal balance) of heart rate variability in healthy older individuals. Toschi-Dias et al. [29] demonstrated that the Sudarshan Kriya Yoga breathing technique improved subjective symptoms while decreasing sympathetic modulation and cardiac autonomic control; specifically, it was shown to increase parasympathetic modulation and cardiorespiratory coupling in in patients with anxiety-depression disorders. Intentional change for respiratory rhythms translates into changes in the neural activity of brainstem [30]. Both cardiorespiratory coupling and the cardiac autonomic nervous system are controlled by a network of neurons located within the lower brainstem [31, 32]. Based on this evidence, we hypothesize that yoga breathing techniques change brain stem activation in patients with psychiatric disorders and lead to improvements in the cardiac autonomic nervous system (mainly associated with parasympathetic nervous system) and cardiopulmonary coupling through the vagus nerve. These breathing techniques represent a top down treatment mechanism of yoga. Therefore, during yoga practice, participants experience both bottom up and top down effects of yoga, and these effects can improve cognitive functions. In the next section, we discuss a third treatment mechanism in yoga, a physical technique that improves cognitive function.

2.4 Neurobiological resonance effects in dynamic components of yoga

Resonance effects between bottom up and top down effects within individuals produced by yoga practice generate a third type of treatment effect. During an asana sequence, the range of motion in a person's joints expands and joint load will largely be maintained at submaximal levels. As a result, physical stress increases over time, manifesting in the muscles, joints, and connective tissue. Therefore, by stimulating the autonomic nervous system, individual arousal is accelerated. As a result, subjective emotional reaction increases, which prompts avoidance behavior. These negative emotional reactions are similar to emotional reactions in negative situations individuals face in social contexts. This is a bottom up effect of yoga. On other hand, the yoga breathing technique used during asana sequence enhances parasympathetic nervous control and cardiopulmonary coupling. This top-down relax effect reduces the subjectively negative emotional reaction that occurs in the asana sequence. This is the top down effect of yoga. The bottom up and top down effects are functionally resonant within an individual during the asana sequence. These resonance effects reduce one's subjectively negative emotional reaction and promote awareness of bodily sensations that produce them. Through this increase in body awareness, an individual can monitor (meta-cognition) perceived emotional events that may occur from moment to moment that arise in the context of yoga practice. Therefore, by enhancing meta-cognitive function, an individual's emotion regulation and self-regulation in practical an aversive context are improved. Previous meta-analysis studies indicated that yoga intervention improved cognitive function for both people with psychiatric disorders and healthy individuals [33, 34]. Eyre et al. [12] reported that patients with mild cognitive impairment who participated in yoga classes had statistically significant improvements in alleviating depression and enhancing visuospatial memory. Jensen and Kenny [13] demonstrated that children with attention deficit hyperactivity disorder who participated in yoga intervention had significantly improved emotional lability at post intervention compared to pre intervention. Furthermore, some studies indicated that yoga intervention significantly enhanced body awareness in individuals with eating disorders [10, 11]. A previous neuroimaging study also demonstrated that gray matter volume of bilateral insula was positive correlated with pain tolerance, and also had positive correlation with yogic experience in yoga practitioners [16]. Additionally, another fMRI study reported healthy elderly yoga practitioners significantly increased gray matter volume in the left lateral prefrontal cortex compared to an age matched healthy control group [8]. The resonance effect of yoga promotes cognitive reappraisal of individuals in terms of negative emotional reactions faced in practical contexts. Cognitive reappraisal gained by the resonance effect of yoga may give new meaning to an individual's emotional reactions, which in turn lead to improved emotional regulation and self-regulation. Thus, interoceptive awareness and monitoring are essential for most affective, cognitive, and interpersonal processes [35]. These observations suggest that the experience of yoga practice decreases avoidance behavior, and this experience may be generalized to other behaviors in social contexts. These are the dynamic components of yoga. Next we focus on meditation, which is a static component of yoga.

2.5 Meditation and breathing technique in static components of yoga

As a static component of yoga, meditation aims to develop mental silence and non-reactive consciousness. Before yoga meditation, participants are instructed to maintain focus on abdominal breathing and observe their interoceptive and physical sensations while keeping their minds blank. During yoga meditation,

individuals develop awareness of both their inner experience, and how this experience functions on a meta-cognitive level. Here, the top-down control of using abdominal breathing reduces the emotional response occurring in an individual during meditation. One's awareness of both their emotional reactions and body are enhanced due to the resonance effect generated by the dynamic component of yoga. Through these effects, individuals can observe emotions and thoughts objectively (non-reactive) without being caught up in them. Static components of yoga promote cognitive reappraisal of one's self as a baseline. Therefore, static components are also found for mindfulness meditation.

3. Theoretical framework and practical evidence of mindfulness meditation

Mindfulness can be defined as the ability to observe thoughts, and bodily sensations or feelings in the present moment with an open and accepting orientation toward one's experiences [36]. Mindfulness meditation that develops mindfulness uses abdominal breathing in a way similar to yoga, and it is seen as a body-mind approach with static components. Mindfulness meditation has been employed for centuries within Buddhist traditions, yet it is has only been since the 1970s that mindfulness has become a target of intervention for several psychological problems [37]. Through facilitating awareness and non-judgmental acceptance of moment-to-moment experiences, these mindfulness-based meditation techniques alleviate intense emotional states [37, 38]. As evidenced by previous meta-analyses, mindfulness meditation based intervention has proven effective in reducing psychological distress, anxiety, depression, and improving well-being and quality of life in individuals with mental disorders [39–41]. In this section, we explain the interaction between three types of meditation (focused attention meditation, open monitoring meditation, and compassion meditation) and breathing technique; these are basic techniques that employ several types of mindfulness meditation.

3.1 Focused attention meditation, open monitoring meditation, and compassion meditation: mindfulness meditation involving a static component

Meditation that develops mindfulness consists of three types of meditation: focused attention meditation, which improves concentration abilities, open monitoring meditation, which improves the ability to monitor our experiences without reactions or judgments, and compassion meditation, which integrates focused attention meditation and open monitoring meditation [42, 43]. Focused attention meditation is a type of systematic training aimed at directing and sustaining attention on a chosen neutral object (e.g., the breath), noticing when the mind wanders from the object, and disengaging from distractions, negative emotions, rumination, or worry by redirecting or shifting one's attention back to the chosen neutral object [42]. Focused attention meditation cultivates both calmness and stability of mind and reduces attention on negative thoughts and emotions [42]. Open monitoring meditation does not involve any specific object of focus, nor does it focus on disengagement from negative thoughts or emotions or expecting them to diminish [42]. Open monitoring meditation entails cultivating non-reactive awareness of automatic cognitive and emotional interpretations of sensory, perceptual, and endogenous stimuli, regardless of valence [42]. During compassion meditation, meditators focus on developing love and compassion first for themselves and then gradually extend this love to evermore "unlikeable" others, and various other creatures [44]. Compassion meditation is often entails that helps practitioners

develop cognitive schemas which cultivate a sense of equanimity and hopefulness. According to a previous review article [45], mindfulness meditation, which consists of focused attention meditation, open monitoring meditation, and compassion meditation, enhances attention control, emotional regulation, and self-awareness in both healthy subjects and individuals with psychosis. Goldin and Gross [46] reported that mindfulness meditation intervention improved self-esteem, and lessened anxiety and depressive symptoms. They additionally reported reduced amygdala activity that corresponded to emotional reactivity during reacting to negative self-beliefs in people with social anxiety disorder. Tomasino and Fabbro [47] demonstrated that focused attention meditation increased activation in the right dorsolateral prefrontal cortex and in the left insula, and that it decreased activation in the rostral prefrontal cortex and in right parietal area. According to Fujino et al. [48], both focused attention meditation and open monitoring meditation specifically reduced functional connectivity between the striatum and posterior cingulate cortex, which is a core hub region of the default mode network. Additionally, open monitoring meditation reduced functional connectivity of the ventral striatum in both the visual cortex related to intentional focused attention in the attentional network and the retrosplenial cortex related to memory function in the default mode network. In contrast, focused attention meditation increased functional connectivity in these regions. Furthermore, other previous studies revealed stronger neural responses to emotional sounds in the anterior insula and anterior cingulate cortex during compassion meditation than when an individual was in a resting state [49, 50]. From these reports, we speculate that mindfulness meditation increases emotional regulation, attention control, and self-awareness. Additionally, we assume the abdominal breathing technique, which is a physical movement, is enormously important in this respect.

3.2 Breathing technique of mindfulness meditation

Prior to mindfulness meditation, participants are instructed to focus on breathing and to let their minds wander, not to focus attention on worries or negative thoughts [51]. Previous studies demonstrated that mindfulness breathing technique used alone alleviated subjective distress and improved meta-cognitive function, emotional non-reactivity, and autonomic nervous control in healthy individuals and those with physical ailments [51–53]. According to Ng et al. [53], 5 minutes of brief mindfulness breathing technique lessened subjective distress, and improved blood pressure, pulse rate, and breathing rate in subjects in palliative care cancer patients. Furthermore, Arch and Craske [51] indicated that 15 minutes of mindfulness breathing enhances an individual's emotional non-reactivity during presentation of negative pictures. Based on these reports, focused attention on breathing is seen to reduce the attention given to distressing experiences or thoughts, and abdominal breathing reduces the role of the sympathetic nervous system and increases that of the parasympathetic nervous system during distressing experiences or thoughts.

3.3 Meditation and breathing technique in static components of mindfulness meditation

The purposes of mindfulness meditation, which is one of the body-mind approaches including static components, alleviate intense emotional states and self-awareness for psychological problems accompanied by aversive emotions, and develop cognitive schemas, which cultivate a sense of equanimity and hopefulness. Here, the psychological problems accompanied by aversive emotions include the problem that is currently occurring and occurred in the past. Participants develop

the objective monitoring function for inner emotions and thoughts without being caught up in them during focused attention meditation and open monitoring meditation. It should be also noted that participants observe psychological problems that are obstacles to cultivating love and compassion for themselves and others with objectively monitoring function during compassion meditation too. Therefore, we hypothesize that these meditations enhance individuals' metacognitive function. Furthermore, before each mindfulness meditations, participants are instructed to maintain focus on abdominal breathing. The top-down control of using abdominal breathing reduces the emotional response occurring in an individual during each meditation. There is suggested that these effects promote cognitive reappraisal of psychological problems which forming the core of the current self and as a result develop cognitive schemas which cultivate a sense of equanimity and hopefulness. This is the effect of the static component which adjusts baseline of self. Thus far, we have explained the characteristics and therapeutic effects of yoga and mindfulness respectively. Mindfulness meditation and yoga are both body-mind approaches which have static components. In addition, previous studies for patients with psychiatric disorders have demonstrated that symptom reduction via attention control, emotional control, and self-awareness are viable treatment mechanisms. On the other hand, mindfulness meditation does not have a dynamic component. Individuals must continue to focus on their own interoceptive sensations and breathing during mindfulness meditation. However, with the dynamic component of yoga, participants are able to automatically focus on their interoceptive sensations or breathing. We assume that yoga-based interventions may be more appropriate for ADHD children who have difficulty sustaining attention. Recently, in order to overcome the problems that currently exist in psychotherapy, yoga, mindfulness, and other body-mind approaches have been aggressively promoted for patients with mental disorders. For example, the aim of conventional cognitive behavioral therapies has been to modify maladaptive cognitive content affecting emotions and behavior. On the other hand, when cognitive behavioral therapy for major depressive disorder is performed, if negative self-cognitive modification is incomplete, it can lead to a return of symptoms [54]. There are also problems in the change of cognitive bias for patients with PTSD, which can increase their pain and emotional burden. These issues can lead to individuals dropping out of the treatment protocol [55–57]. Therefore, there has been more attention given to body-mind approaches that have an effect on cognitive functions through bodily functions. However, in terms of body-mind approach treatment mechanisms, there has little discussion of a comprehensive framework based on the dynamic and static component models. In the next section we examine the Pilates method, which is another body-mind approach, and behavior activation, a third generation cognitive behavior therapy.

4. Theoretical framework and practical evidence of Pilates method

Pilates method was developed in the 1920s by Joseph Pilates and consists of comprehensive body conditioning, which aims to develop better body awareness and improve posture. The Pilates method requires core stability, strength, and flexibility, as well as attention to muscle control, posture, and breathing [58]. At first, the Pilates method gained popularity in rehabilitation settings [59]; however, in recent years Pilates based exercise has become popular among the general population. In the modern Pilates method, after adjusting one's breath (a costal breathing technique), an individual performs a series of approximately 25–50 simple, low-impact flexibility and muscular endurance exercises with emphasis on muscular exertion in the abdominals, lower back, hips, thighs, and buttocks

in combination with timed breathing [60, 61]. The Pilates method is one of the body-mind approaches featuring a dynamic component. According to previous meta-analysis studies, the Pilates method improves physical flexibility, dynamic balance, and muscular endurance in healthy people [62], as well as physical balance in older adults [63]. Additionally, some randomized controlled trials studies have demonstrated that the Pilates method improved subjective degree of pain, subjective degree of disability, and kinesiophobia [62, 64, 65]. However, to the best of our knowledge, few studies have investigated intervention effects of the Pilates method for symptoms of psychiatric disorders, as compared to the research in this area employing other body-mind approaches. We assume that the primary objective of the other body-mind approaches is improving mental condition, while the primary goal of Pilates method is to improve physical health. Second, we speculate that present interventions which use the Pilates method are not sufficient to be effective for psychiatric disorders. However, if the dynamic component of the Pilates method could be adjusted, it is possible this method could be an effective intervention for some psychiatric disorders. In the next section we examine the potential intervention effect of the Pilates method for individuals with psychiatric disorders.

4.1 Potential intervention effects of the Pilates method for individuals with psychiatric disorders

In the Pilates method, participants adjust their physical condition using costal breathing before exercise. This is one of the main differences from yoga. As previously mentioned, costal breathing increases the activity of the sympathetic nervous system. This boost of the sympathetic nervous system both increases the heart rate and enhances the metabolism of one's body. We speculated that if the aim of the Pilates method is dieting or physical fitness for healthy individuals, this breathing technique is appropriate. However, previous meta-analysis studies have demonstrated that patients with psychiatric disorders had reduced high frequency of heart rate variability (which is influenced by the parasympathetic nervous system) compared to healthy subjects [66, 67]. Therefore, we consider that it may be better to adopt the breathing technique which increases parasympathetic activity, such as abdominal breathing, in the Pilates method. In fact, a numerous interventions which use the modern Pilates method have adopted this breathing technique [58]. However, these techniques are used only to adjust physical condition prior to exercise and are not used during exercise. We assume if one adjusts abdominal breathing while engaging in an easy pose, such as a "cat stretch" or "mermaid stretch", the effects of the dynamic component of Pilates method may be more effective. In this case, the Pilates method may be an effective intervention for psychiatric disorders.

5. Theoretical framework and practical evidence of behavioral activation

Based on the approach of Lewinsohn et al. [68], behavioral activation is focused on enhancement of self-monitoring, increasing healthy goal-oriented behavior, and increasing environmental reward frequency. In the course of behavioral activation interventions, participants monitor and assess their daily activities and work to change their habitual behaviors in a way that aims to increase pleasant events and interactions and reduce depressive symptoms [69]. Behavioral activation is another body-mind approach including a dynamic component. Previous meta-analysis studies have demonstrated that behavioral activation is an effective treatment for depression [70, 71]. Dimidjian et al. [72] indicated that treatment effects of behavioral activation

are comparable in efficacy to pharmacological therapy for individuals suffering from depression. Our previous studies reported that behavioral activation improved abilities both to access positive reinforcing activities and to engage in rewarding behaviors under adverse circumstances [73, 74]. Additionally, Jacobson et al. [69] showed behavioral activation significantly improved self-concept in people with depression. A few previous neuroimaging studies have also demonstrated that behavioral activation enhances one's cognitive function and corresponds to brain activations in people with subthreshold depression [75–77]. Specifically, our previous studies indicated that brief behavioral activation had increased activation in the dorsomedial prefrontal cortex in individuals with subthreshold depression, which is associated with meta-cognitive function, and that this activation is also correlated with an improvement in depressive symptoms [76, 77]. Based on these reports, we hypothesized that there should be two treatment mechanisms of behavioral activation for depression. The first is involved in reducing depressive symptoms to improve the reward system, and the second involved in improving depressive symptoms to enhance meta-cognitive function. Future research is needed to verify the above hypotheses related to these two treatment mechanisms.

6. Ethical guidelines of body-mind approach within the medical and educational domains

The primary purpose of medical research involving human subjects is to understand the causes, development, and effects of diseases and improve preventive, diagnostic, and therapeutic interventions (methods, procedures and treatments). Even the best proven interventions must be evaluated continually through research for safety, effectiveness, efficiency, accessibility, and quality [78]. In this section we review four body-mind approaches that have gained attention in recent years. Each approach has different characteristics (see **Table 1**). Here, for practitioners and researchers, we discuss the current and future issues of each approach. First, further neurobiological examination is necessary for the body-mind approach. For example, yoga and mindfulness are speculated to be very similar approaches in their emphasis on enhancing attention control, emotional regulation, and self-awareness which using one's interoceptive sensations or breathing. However, to the best of our

	Dynamic component	Static component	Subject	Degree of structuralization	Intervention effect
Yoga	Asana sequence and abdominal breathing	Meditation	Healthy -mental diseases	Medium	Medium
Mindfulness meditation	—	Meditation	Healthy -mental diseases	High	High
Pilates method	Pose sequence and costal breathing	—	Healthy	Medium	Low
Behavioral activation	Positive activities	—	Healthy -mental diseases	Low	High

Table 1.
The difference of characteristics for each body-mind approaches.

knowledge, there are few neurobiological studies that compare yoga and mindfulness. This is also true for research comparing the effects of the Pilates method to other approaches. A second important point regards the enhancement of treatment effects in each of the body-mind approaches. According to a previous meta-analysis study [79], the treatment effect of yoga is not sufficient compared to other types of active control (Hedges' g = 0.30). However, this study did not fully examine the therapeutic effect of each asana. We assume that a structured asana sequence is necessary to more greatly enhance the therapeutic effect of yoga. Third, as we noted above, there are many therapies applying the mindfulness meditation in recent years (e.g., dialectical behavior therapy, mindfulness-based cognitive therapy, and acceptance and commitment therapy). This is because the disease to be treated, the duration of the treatment effect, and the intervention duration are different for each therapy. On the other hand, it can be more conveniently implemented by someone, and versatility treatment is necessary. Thereby, it is necessary to examine the treatment model used in conventional mindfulness-based therapies from neurobiological perspectives to extract essential factors. Furthermore, new mindfulness meditation-based treatment, which integrates essential factors in conventional mindfulness-based therapies, should be developed. Forth, we speculate it is necessary to examine the treatment effects of body-mind approach for not only basic emotions (e.g., fear, anger) but also complex emotions (e.g., awe, shame) and social cognition. A few previous studies [80] indicated that mindfulness meditation alleviated subjective symptoms of anxiety and enhanced social skills for people with learning disabilities. From the evidence, it could be considered that other body-mind approaches may enhance complex emotions and social cognition. It is necessary to provide a higher-quality body-mind approach based on previous evidence that can be adjusted to fit the needs of medical institutions and school schedules. Finally, the research that uses the body-mind approach for psychiatric disorders is at an early stage at present. We speculate that it is necessary to establish more detailed ethical guidelines for each approach corresponding high-quality body-mind approach in the near future.

7. Conclusion

In this chapter, we introduced and discussed neurobiological treatment effects and mechanisms of yoga, mindfulness meditation, Pilates method, and cognitive behavior therapy. In recent years, these body-mind approaches have been actively adopted in the educational and medical fields in Western countries. In the future, it is necessary to clarify the detailed neurobiological mechanisms of each body-mind approach and provide higher quality service in both medical and educational settings. At the same time, we should also extend knowledge and technology to countries and regions where body-mind approaches are not widely available.

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Conflict of interest

None of the authors have any conflicts of interest to declare regarding the findings of this study.

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With the conclusion of the *Decade of the Brain* and *Decade of the Mind*, neuroscience has advanced well beyond single neuron functions, and begun to investigate global properties that emerge from central nervous system operation. Core ethical issues for neural intervention, in consequence, now touch on concerns over how the individual as a whole may be affected. Central to these concerns is the fundamental value of the human being, which lends normative weight to questions, interventions, and practices influencing him or her. Yet, despite wide recognition of the crucial relevance of human value, the derivation of metaethical principles that underwrite this value is by no means uniformly agreed to. Why and how the human being is normatively privileged, accordingly, emerge as core questions that frame issues of ethical praxis. This book tackles this dissonance, and exposes the philosophical foundations that are rooting contemporary divisions in ethical approaches to intervention in the nervous system.

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