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Physioethology: a post-humanist perspective on physiotherapy

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ABSTRACT

Physiotherapy faces mounting challenges in an era of planetary crisis. This paper proposes a reorientation of physiotherapy through the philosophy of Gilles Deleuze and Félix Guattari, specifically their concept of ethology, which foregrounds affect, relation, and immanence. We argue that contemporary physiotherapy remains tethered to anthropocentric, essentialist, and representational assumptions that limit its capacity to respond to complex ecological entanglements. Drawing on ethology, we explore how bodies, human and non-human, can be understood not as stable entities but as dynamic assemblages defined by what they can do. We consider the implications of this approach for practice, education, and planetary health, suggesting that physiotherapy shift from its traditional forms of praxis toward a dynamic composition of capacities. In doing so, the profession might cultivate an ecologically attuned, affectively sensitive, and experimentally oriented practice capable of engaging in the world.

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Introduction

The contemporary professional challenges facing physiotherapists and many of the other orthodox healthcare professionals are now well known (Nicholls et al, 2023). From the increasingly complex problem of how to manage long-term co-morbidities in the face of public sector austerity, the loss of trust in the authority of healthcare experts, and a growing social divide of wealth and increasing unmet need in respect to access to healthcare, there are large and seemingly insurmountable pressures on all the professions to reform. Adding to this, healthcare professionals are under pressure to stay evidence-based in their decision-making, while public interest in consumerist healthcare alternatives rise. Simultaneously, healthcare systems are overstretched, navigating expanding needs and competing for status amidst declining credibility fueling widespread professional anxiety in a post-professional era (Nicholls, 2017; Nicholls et al, 2023; Susskind and Susskind, 2015). Focussing on the physiotherapy profession, the frustration and fear that now emanates on social media and literature is only compounded by the absence of a history of creativity and radical innovation (Nicholls, 2017). There appears to be no clear plan for how to

navigate the profession into the very uncertain future, and faith in the power of clinical evidence to substantiate the profession's value has been disappointing (Nicholls, 2017). Despite increased adoption of evidence-based practice, physiotherapy struggles to gain traction in their efficacy, particularly in the long term (Dubé et al, 2024; Ferri et al, 2024; Wood and Hendrick, 2019) and traditional viewpoints of evidence-based practice remain contested (Greenhalgh, Howick, and Maskrey, 2014; Ratnani et al, 2023).

In *The End of Physiotherapy* (Nicholls, 2017) it was argued that one of the causes of present-day problems for the profession was its historical commitment to treating the body-as-machine; an approach which had proven invaluable in establishing physiotherapists' credibility but was now working against practitioners because it focused on a biomechanical understanding of health and illness. Consequently, physiotherapists have come to lack the cultural, economic, historical, philosophical, political and sociological vocabulary to critically analyze what is happening to healthcare today and what to do about it (Nicholls, 2017).

Some might argue that physiotherapy is adapting and showing important signs of professional evolution.

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However, it could equally be argued that these changes are largely in line with the profession's existing ideologies. The turn toward greater self-care and personal responsibility (Clouder and Adefila, 2017; Larsson, Kreuter, and Nordholm, 2010; Lyhnebeck et al, 2024) aligns with physiotherapy's longstanding individualistic approach to therapy, and follows closely with the profession's ties to neoliberal biopolitics (Powell, 2023). Similarly, the trend toward greater specialization also conforms to the profession's drive for prestige and social capital, rather than democratized, affordable and accessible healthcare for all (Bennett and Grant, 2004; Goyal and Jandyal, 2014; Ojukwu et al, 2022). The profession's growing interest in the psychology of illness remains largely confined to the behavioral and cognitive dimensions of phenomena like chronic pain (Mescouto, Olson, Hodges, and Setchell, 2022), those that fit most closely to a bioscientific understanding of experience, while existential and socially constructed understandings are eschewed, despite the professions much vaunted claim to now be bio-psycho-social (Driver, Oprescu, and Lovell, 2019; Thomson et al, 2019; Vanderstraeten et al, 2023).

Physiotherapy has struggled to come to terms with addressing cultural critiques about the historically gendered, radicalized and ableist nature of the Western bioscientific health professions (Bisconti, Brindisino, and Maselli, 2020; Breedts and Barlott, 2024; Dalboni, Garc  z,   c, and Vaz, 2023; Jang, Costa, Rusinga, and Setchell, 2023; O'Shaughnessy and Tilki, 2007; Opie, 2015; Sivagurunathan et al, 2019; Smith et al. 2024; Stenberg et al, 2021; Vazir et al, 2019). Efforts to develop collective or population-based models of care have been limited, with the profession continuing to rely on an expensive and unscalable person-to-person approach to therapy. Physiotherapy has offered little by way of a response to the social determinants of health, often defaulting to individual behavior management, approaches which are well known to be less effective in the long-term, but are easier to discharge (Baum, 2016; Braaten et al, 2021; Maric and Nicholls, 2022; Mbada et al, 2019). Despite longstanding acknowledgment of non-human biological agents and processes as critical to illness and recovery, the profession has rarely extended its thinking beyond the domain of human experience (Maric and Nicholls, 2022; Nicholls, 2019, 2022a). More recently, physiotherapy's role in enabling industrial capitalism has further unsettled its self-perception as a socially unbiased and apolitical profession (Nicholls, 2022b).

In this paper, however, we explore the latest and perhaps greatest of challenges to the profession in considering physiotherapy's role in the rapidly unraveling

ecological erosion and its relation to health. Born of a critical desire to be a positive force for an otherwise physiotherapy, a nascent interest in critical ecological studies has emerged within the profession (Li, Fryer, Chi, and Boucaut, 2024; Maric and Nicholls, 2022; Maric, Plaisant, and Richter, 2024). There are two important principles underpinning this work. The first is the desire to resist the kinds of despondency and nihilism that have paralyzed so many people in the past, and instead to offer a hopeful vision of the future for the physical therapies as vibrant actors on an ecological scale. The second is a wish to escape the dogmatism that surrounds conventional approaches to scholarly inquiry.

Environmental physiotherapy embraces a wide range of non-traditional approaches to thinking and practice, including post-qualitative methodologies, indigenous cosmologies, the creative arts and collaborative making, as well as a range of radical new philosophical approaches. This paper builds on this growing tradition drawing on the posthuman process philosophers Gilles Deleuze and F  lix Guattari, particularly their concept of ethology (Deleuze and Guattari, 1987), which emphasizes the capacity of entities to *affect* and be *affected* within complex, interdependent systems. When referring to "*affect*" we are referring to the capacity of entities to influence and be influenced. This requires further clarification, which we will provide through the example of a knife. A knife may either be sharp or dull, sharpness being a property of the knife. However, its capacity to cut may never be actualized if the knife is never used (e.g. kept in a drawer and forgotten). Should this capacity be actualized, the knife exercises its power both to cut and to be cut. In other words, the knife's capacity to affect other things is a "*real*" capacity even if it is not currently exercised. This capacity is contingent on the existence of things that can be affected by it, that is, things that can be cut (cheese, meat, string etc) as opposed to things that could not be cut (e.g. titanium). The implication here is that although the capacity to cut depends on the property of sharpness, it cannot be reduced to that property alone (DeLanda, 2011; Kleinherenbrink, 2019).

This paper proposes that a relational and ecological ontology offers a powerful alternative to anthropocentric models of health, opening new possibilities for physiotherapy practice in the context of planetary crisis.

To guide the reader through this argument, the structure of the paper is as follows. We start by problematizing health and physiotherapy's traditional Western biomedical approach toward it. We suggest that if we are going to offer anything to the planetary health crisis, we must be able to see health as more than just a human

biological, experiential or social question. To that end, we make a case for a posthuman reading of health, advocating for an approach that is adequate to the task of engaging with the relational interconnections of all events and occasions within the cosmos. To achieve this, we critique the often-unexamined philosophical assumptions and biases of contemporary Western healthcare and propose, in their place, an ethological metaphysics. Our purpose in this paper is not to undertake an exhaustive ethological analysis, per se (that work is in process and will be reported on at a later date), but rather to argue for its utility as an approach that reaches beyond the current physiotherapy frame and opens up new vistas of possibility. Our belief is that ethology offers some compelling, theoretically intriguing and practically useful tools for analysis and shows just how applicable the physical therapies might be as healthcare adapts to fluid ecological, social, and political conditions. Finally, we reflect on the implications for practice, education, and collective ecological responsibility.

While this paper engages with complex philosophical ideas, we aim to make these relevant and accessible to physiotherapists, educators, and researchers navigating real-world challenges. To begin with, then, we explore how health has been framed and consider how this approach has contributed, in sometimes strange and perplexing ways, to the very problems physiotherapists are now trying to resolve.

The problem of “Health”

Physiotherapists work within healthcare environments, yet the concept of health itself warrants deeper analysis. The concept of “health” has evolved in society over time, mirroring transitions in societal values and changes of medical understanding within Western thought. The term originates from the Old English “hale,” signifying “wholeness” or “being whole and sound,” a notion that initially centered on the biomedical model. This model conceptualizes health as the body’s capacity to fulfill its biological functions, with disease perceived as a disruption to these functions. For instance, the Oxford Dictionary (2023) defines health as “soundness of body; that condition in which its functions are duly and efficiently discharged,” while Merriam-Webster (2023) offers a definition of health as “the condition of being sound in body, mind, or spirit, or free from disease.” These definitions underscore physical integrity, mental alertness, and spiritual harmony, emphasizing the absence of disease or physical impairment and reflecting a “naturalistic” philosophical orientation. However, these definitions largely overlook the

entanglement of health with environmental and non-human factors.

The biomedical model’s emphasis on physiological and mental dimensions, often in isolation, presents notable limitations. In 1946, the World Health Organisation (WHO, 1946) introduced a revised definition of health, describing it as “a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity.” This marked a paradigm shift (Kuhn, 1962) toward a “holistic” understanding of health, acknowledging the interconnectedness of physical, mental, and social factors as integral to well-being. This ambitious and arguably unrealistic approach reflects an expanded view of the individual as an integrated entity, recognizing that multiple dimensions contribute synergistically to overall health.

Despite the broader scope implied by this definition, healthcare in modern Western systems remains predominantly anthropocentric, often neglecting the interconnections between human health and non-human entities, including animals, plants, fungi, meteorology and ecosystems. Although environmental considerations have become increasingly prominent within public health discourse, their integration remains limited within specialized domains such as musculoskeletal physiotherapy (McKenzie et al, 2022). While holistic models have expanded the view of health beyond biology, they remain predominantly anthropocentric, rarely accounting for the broader ecological networks in which health is embedded. This raises pertinent questions regarding the potential for physiotherapy to expand its conceptual framework, encompassing ecological factors and acknowledging the complex interdependencies between human health and environmental health. To explore this, we must reconsider the philosophical foundations that underpin current models of health.

A philosophical exploration of human-centered healthcare raises fundamental questions about the nature of health itself. Is health best understood as a “natural” biological state, or as a “holistic” state grounded in human values – yet still largely disconnected from environmental and planetary concerns? Naturalistic perspectives, such as the biomedical model, define health in terms of physical and physiological processes that are tangible, measurable, and amenable to scientific analysis (Boorse, 1997). But can health truly be reduced to biological function alone and what are the implications of doing so? In contrast, holistic philosophies emphasize value-laden dimensions such as purpose, goals, and meaning (Nordenfelt, 2007). Yet this raises another critical question: how are these values

constructed, and for whose benefit? More urgently, is it possible to conceptualize a model of health that does not continually privilege human flourishing at the expense of other forms of life?

Critiquing human-centered healthcare

The term “humanism” broadly denotes a worldview that foregrounds the importance of human agency in shaping historical and cultural trajectories, a premise fundamental to the humanities. This orientation is evident in the disciplines’ focus on various domains, including epistemology (the nature of knowledge), ontology (the nature of being), logic, ethics, and aesthetics. However, in recent decades, this paradigm has faced extensive critique from diverse intellectual movements, including poststructuralism (Foucault, 2001), vitalist materialism (Deleuze, 1988, 2021), new materialism (DeLanda, 2016), feminist materialism (Barad, 2007; Bennett, 2010; Grosz, 1994; Haraway, 1988), anti-racist perspectives (Leong, 2016), postcolonial movements (Willey, 2016), and posthumanism (Braidotti, 2019; Daigle and McDonald, 2022; Dillard-Wright et al, 2023). These critical perspectives endeavor to transcend humanism while acknowledging the enduring influence of its conceptual legacy. As Braidotti (2019), p.9 notes, “critiques of European Humanism pertain to the very tradition of European Humanism,” suggesting that humanism can be interrogated both within and against its framework. Paradoxically, posthumanism seeks to move beyond humanism by operating both within and against its entrenched anthropocentric foundations (Braidotti, 2019).

Daigle and McDonald (2022) argue that humans have long constructed narratives to legitimize their assumed privilege. From the moment humans acknowledged their existence among other beings, they have worked to extricate themselves from dependency on external relationships, striving to assert dominance over their environment. As Latour (1991) contends, modernity has constructed a false dichotomy between nature and culture, in which nature exists as an object to be studied, controlled, and manipulated, while culture is cast as the exclusive domain of human agency and freedom. Yet, the question of who qualifies as “human” remains as elusive as it is exclusive. The categorical distinctions and philosophical frameworks that attempt to delineate “human” identity have historically engendered genuine forms of oppression and exclusion. As the boundaries of the “human” continue to shift, an increasing number of theorists argue that we may never have been fully “human” (Haraway, 1991) or,

indeed, that we are *already* posthuman (Dillard-Wright et al, 2023).

In recognizing the notion of “*the human*” and, by extension, humanism, as constructs of transcendent ideals, we see that these ideals are intricately woven into our lived experience. Rejecting a transcendental deity in favor of human rationality has effectively positioned humans themselves as transcendent (Daigle and McDonald, 2022), elevating them atop a hierarchical structure rather than within a complex web of interrelated entities. In other words, instead of God determining universal laws and practices, modernity has turned toward human knowledge and attention, thereby privileging our being over other entities in existence.

This hierarchy risks elevating a privileged human subject while marginalizing the vast majority of beings, both human and non-human, who fall outside its narrow frame. This transcendent ideal of the human is not merely a conceptual illusion; it serves as a mechanism to inflict suffering upon others, both human and non-human, and to legitimize the exploitation of organic and inorganic life by asserting human supremacy over all else, barring transcendent ideas such as Platonic Forms, a deity, or the “human subject” itself. This tendency to elevate the human as a transcendent organizing principle positioned above or outside the ecological and material world is precisely what Deleuze and Guattari critique in their posthuman philosophy of immanence. Their work resists hierarchical ontologies and instead emphasizes the fluid entanglements of all entities within a shared plane of existence.

Medical humanism, with roots in ancient Greek medicine and later revived in the mid-20th century as a response to technological and bureaucratic detachment, sought to reassert the value of individual experience in clinical care. Contemporary models such as “personalised care” continue this tradition by attempting to recognize patients as whole persons with unique values, needs, and contexts. In many cases, this movement has contributed to more compassionate, relationship-based care and has played an important role in challenging purely biomedical reductionism (Killingback, Green, and Naylor, 2022). However, even in its modern form, “personalised care” may inadvertently re-center the human subject in ways that reinforce anthropocentric and individualistic ideologies (Hippocrates, Chadwick, and Mann, 1983; Willoo, 2022). It may be prudent to consider whether the emphasis on “personalised care” unintentionally reinforces neoliberal ideologies by promoting individual accountability (Powell, 2023, pp. 61–68), particularly in the face of an aging population and an overextended welfare state (Nicholls, 2017, 2022a). There are,

however, pragmatic barriers to moving beyond human-centered care. Clinical practice is deeply shaped by professional training, resource allocation, regulatory structures, and patient expectations. Additionally, physiotherapy remains grounded in systems that privilege its historical allegiance to medicine, metrics of efficiency, and evidence-based metrics. While a more-than-human, ecological model of care offers a compelling theoretical reorientation, its practical implementation will require shifts not only in thinking but in the social, institutional, and economic structures that shape practice. Paradoxically, a “person-decentred” approach to healthcare may, in fact, better align with the goals of person-centered care, cultivating an approach that respects interconnectedness rather than isolated individualism (Gibson et al, 2021).

If we are to take this seriously, we must ask: what other ontological and philosophical frameworks might offer a more inclusive, interconnected, and ecologically attuned alternative?

A case for posthumanism

As mentioned, in recent decades, the concept of “the human” has become increasingly contested, reflecting deepening debates over who or what qualifies as human (Braidotti, 2019). This ambiguity surfaces in everyday digital environments, where users must verify their “humanity” to access content proving they are not machines. Similarly, in social contexts, individuals may be called upon to demonstrate cognitive competence, moral reasoning, or normative behavior to be recognized as fully human. Despite these inconsistencies and exclusions, “the human” remains a central organizing principle in how knowledge, care, and value are structured. It continues to shape who is considered human and how reality is arranged around the authority of *Homo sapiens* (Susen, 2022).

Western constructions of the human have historically relied on binary oppositions such as human versus non-human, nature versus culture, reason versus emotion, intention versus instinct (Susen, 2022). These oppositions sustain hierarchical thinking that privileges certain lives and marginalizes others. In contrast, many Indigenous and non-Western knowledge systems resist such dualisms, instead emphasizing relational entanglement, reciprocity, and dynamic coexistence (Sahlins, 2014). These perspectives challenge the dominant Western image of the human as a discrete, autonomous subject.

Latour (1999) offers a helpful reorientation. He writes, “An entity gains in reality if it is associated with many others that are viewed as collaborating with it. It

loses in reality if, on the contrary, it has to shed associates or collaborators (human and non-human)” (p. 158). This ontological claim affirms that being is not defined by separation, but by connection and interdependence. This resonates with posthumanist thinking, which seeks to decenter the human and reframe identity, agency, and value as distributed across networks of bodies, technologies, ecologies, and systems.

Posthumanism, in this context, is not merely a rejection of human exceptionalism – it is a philosophical orientation that reimagines ethics, health, and care beyond the confines of individualism and anthropocentrism. It is important to note that posthumanism encompasses a range of approaches. Critical posthumanism, for instance, interrogates the sociopolitical construction of “the human” and its entanglement with systems of exclusion such as colonialism, patriarchy, and anthropocentrism (Braidotti, 2019; Herbrechter, 2013). While these concerns are vital, this paper does not adopt a critical posthumanist stance. Rather, it draws on the ontological and relational aspects of posthumanism, grounded in the process philosophy of Deleuze and Guattari. Here, the emphasis is not on dismantling identity categories, but on exploring the dynamic interrelations and affective forces that constitute living and non-living systems, including physiotherapy.

Deleuze and Guattari’s posthuman ontology foregrounds concepts like becoming, multiplicity, and immanence, offering a framework in which life and meaning emerge through relational fields rather than fixed categories (Deleuze, 2021; Deleuze and Guattari, 1987). Their work rejects hierarchical ontologies and static identities, proposing instead that bodies, human and otherwise, are shaped through assemblages of movement, matter, and context. This metaphysical reorientation opens new possibilities for rethinking physiotherapy as an ecological, responsive, and ethically entangled practice.

To cultivate this change in perspective among healthcare practitioners, educators, and systems leaders, we must begin by interrogating the philosophical assumptions that underpin our models of care, knowledge, and being. This interrogation starts with ontology.

Basic implicit assumptions

In healthcare, the concept of bias traditionally evokes images of methodological errors or subjective influences, in particular cognitive ones that threaten objectivity. However, there exists a form of bias that permeates thought at a deeper, often unacknowledged level: philosophical bias. Unlike methodological biases,

philosophical biases are rooted in fundamental assumptions about the nature of reality, knowledge, and the norms that govern scientific practice. Such biases are unavoidable and embedded in the very foundations of inquiry, shaping research design, interpretation, and application (Anjum, Copeland and Rocca, 2020; Andersen, Anjum, and Rocca, 2019).

Philosophical biases often manifest through assumptions about causality, determinism, and reductionism. These assumptions create implicit boundaries around how we explain the world and what kinds of knowledge are considered valid. For example, in biomedical science, researchers often assume particular models of causation, such as frequentism, not because they are empirically proven, but because they are embedded in the dominant methodological frameworks of science itself. Such assumptions influence the construction of hypotheses and the interpretation of results, thereby directing scientific practice along certain paths while excluding others that might emerge from different ontological or epistemological commitments (Anjum, Copeland and Rocca, 2020; Andersen, Anjum, and Rocca, 2019). Recognizing these deeper biases does not undermine scientific practice, rather, it reveals the often-invisible philosophical scaffolding that shapes what kinds of questions can be asked, and what kinds of answers are considered valid (Douglas, 2000). To unpack this further, we turn to the ontological and epistemological assumptions that underlie contemporary healthcare thinking.

Ontological and epistemological entanglements

One key site of philosophical bias in healthcare lies in the ontological assumptions underpinning scientific inquiry. Ontology, the study of what exists, influences whether practitioners understand the world in terms of fixed entities (such as cells, tissues, or muscles) or dynamic processes (such as interaction, adaptation, or emergence). This distinction affects how complexity is interpreted, both in research and in clinical reasoning.

For example, molecular biology often foregrounds discrete entities, treating processes (like protein formation) as secondary outcomes of interactions between those entities. In contrast, ecology tends to prioritize processual relations, where patterns of interaction, environmental dependencies, and systems-level dynamics as more fundamental than any single entity (Guttinger, 2018; Nicholson and Dupré, 2018). Put differently: are things what they are because of their structure, or because of their participation in a dynamic network of relations?

These contrasting views have real-world consequences. Consider the debate over genetically modified (GM) crops. Molecular biologists often argue for the essential equivalence of GM and conventional crops, based on shared genetic sequences (Andersen, Anjum, and Rocca, 2019; Rocca and Andersen, 2017). Ecologists, however, raise concerns about the emergent, unpredictable effects of GM crops on ecosystems, arguing that contextual processes and interactions matter more than genetic substance. One view assumes that genetic structure defines identity and behavior, the other argues that ecological context and interaction are primary.

These differences are more than abstract debates, they shape scientific claims, clinical decisions, and policy directions (Kvakkestad, Gillund, Kjolberg, and Vatn, 2007). The same ontological tensions are present in physiotherapy. Clinical reasoning often shifts between mechanistic explanations, where dysfunction is localized in parts (e.g., joints, tissues, nerves), and relational or systemic approaches, where function and recovery are seen as emergent from interactions between body systems, social environments, and therapeutic encounters. Understanding how different ontological commitments inform our models of care can help physiotherapists navigate tensions between reductionism and emergence, substance and process, and intervention and interaction.

Reductionism and emergence

Reductionism, the assumption that complex systems can be understood entirely by analyzing their parts, is a prevalent philosophical bias in many healthcare disciplines. This approach is effective for isolating variables and understanding specific mechanisms, yet it often neglects emergent properties that arise from the interactions between parts. Emergentism, conversely, suggests that the whole can exhibit properties not found in the individual parts. For example, in studying low back pain, traditional reductionist approaches break down people's lived experience into biomedical and biomechanical components of the body (e.g. pain arising from the intervertebral disc or brain) into individual components for analysis, assuming that the sum of parts represents the whole. More recent human-centered models, such as cognitive functional therapy (CFT) (O'Sullivan et al, 2018), recognize that key interactions between components not evident when these are analyzed in isolation (Anjum and Mumford, 2017; Peterson et al, 2003). However, despite CFT having a broader scope of analysis, the tendency to use reductionist approaches is still particularly strong.

These differing philosophical orientations underpin contrasting definitions of health. Naturalistic definitions, for instance conceptualize health as a state in which an individual's organs function within statistically normal parameters (Boorse, 1997). In contrast, a holistic definition posits that a person is healthy if they can achieve their vital goals under standard conditions (Nordenfelt, 2007).

There are philosophical challenges inherent in translating both “naturalistic” and “holistic” perspectives from their ontological bases into epistemic practices. The naturalistic model is often criticized for its reductionism; whereby complex systems are deconstructed into simpler components. This process, termed “*undermining*” by Harman (2013), refers to the belief that higher-order entities and processes can be fully explained by their constituent parts. Reductionism pervades medical sciences, influencing diagnostic, therapeutic, and preventative measures, but it faces challenges in addressing emergent phenomena, where the whole exhibits properties not apparent in its parts (Ahn, Tewari, Poon, and Phillips, 2006). For example, the combination of hydrogen and oxygen produces water, a substance with characteristics beyond those of its constituent elements (Harman, 2013; Weir and Harman, 2022).

In contrast, “holistic” perspectives assert that entities exist relationally and cannot be reduced to their constituent components. These relations extend across physical, chemical, social, and symbolic domains, forming a web of interdependence. However, this approach risks what Harman (2013) calls “*overmining*” a philosophical tendency to explain entities entirely through their external relations. In doing so, it becomes difficult to account for the entity itself as something with properties or potentials that exceed its current relational context, making change, novelty, or counterfactual reasoning harder to accommodate (Weir and Harman, 2022).

Efforts to reconcile these limitations have led to approaches that incorporate both reductionist and relational perspectives, a strategy Harman (2013) terms “*duo-mining*.” This refers to attempts to explain phenomena by drawing simultaneously on both an entity's internal structure and its external relations, without fully collapsing into either pole. For example, some theoretical models, such as Saad and Prochaska (2020), attempt to reduce health considerations from societal to individual and cellular levels, while also describing the interactions and feedback loops that occur between those levels.

Such philosophical tensions may have profound implications for healthcare practice, where the

conceptual frameworks applied influence which entities are prioritized, valued, or marginalized. The bio-psycho-social model, for instance, illustrates how diverse ontological stances can converge within healthcare practice, blending biological, psychological, and social elements. Each aspect of the bio-psycho-social model has a distinctive and very different philosophical grounding. The biological basis reduces downward into biological component parts, the psychological reduces upwards into consciousness, ego, or mind and the social into co-construction of reality. This convergence leaves healthcare practitioners navigating a confusing liminal space, attempting to integrate and apply these intersecting perspectives through “*duo-mining*” (Daluiso-King and Hebron, 2022; Engel, 1977; Harman, 2013; Mescouto, Olson, Hodges, and Setchell, 2022).

The reductionist paradigm has been influential in physiotherapy, particularly in the development of diagnostic and therapeutic practices that focus on specific biological mechanisms observed frequently over space and time. However, the limitations of reductionism have spurred calls for more integrative approaches that account for the complex interplay between biological, psychological, and social factors, epitomized by the bio-psycho-social model proposed by Engel (1977). However, such models still prove to be limited in their breadth of scope as well as their implementation (Daluiso-King and Hebron, 2022; Mescouto, Olson, Hodges, and Setchell, 2022; Nicholls et al, 2023). Any such philosophical framework needs to account for both change and emergence.

Normative assumptions about physiotherapy practice

Philosophical biases also encompass normative assumptions, the often-unexamined beliefs about how physiotherapy should be practiced. These assumptions have underpinned Western healthcare for over two centuries, shaped by the emergence of epidemiological data and statistical tools such as means, probability and standard deviations. These instruments defined thresholds for what counted as healthy, fit, or sane, and by extension, who needed treatment to be brought back to the statistical norm (Foucault, 1973).

In the 20th century, physiotherapy adopted these norms wholesale. It embraced rigid taxonomic boundaries placing the body firmly within its jurisdiction and relegating the mind to the domain of others. Physiotherapy aligned itself with medical classifications of body systems and organs, standardized assessments of physical ability, and later, the norms of evidence-

based medicine. These frameworks helped physiotherapy establish itself as the state's principal provider of physical rehabilitation, securing its professional legitimacy through the reinforcement of objective, measurable, and verifiable knowledge (Nicholls, 2017). But this process of normalization, as Foucault (1977) describes, draws hard boundaries between what is considered “normal” and what is not. It also obscures or excludes phenomena that do not easily fit within a biomedical model. In physiotherapy, this has marginalized a wide range of domains: mental health, relational meaning-making, indigenous and non-Western knowledge systems, the unconscious, social determinants of health, and, critically, the non-human world and planetary environment.

This has led to a paradox: the very framework that once enabled physiotherapy's professionalization, its mechanistic focus on the body-as-machine, now impedes its relevance in a rapidly changing world (Nicholls, 2017). Nor is physiotherapy alone in this. Most orthodox healthcare professions continue to struggle with integrating non-traditional or systemic approaches. For instance, the International Classification of Functioning, Disability and Health (ICF) framework still treats the environment as a secondary “contextual factor,” and Western biomedicine continues to prioritize the RCT as its epistemological gold standard. This persists despite the rising need for heterogenic community-led services that are better suited to support aging and chronically ill populations (Anjum and Rocca, 2018; Howick, 2011), services that remain largely bereft of environmental considerations, which are often treated as fixed or external rather than dynamic, interdependent processes (Kwan, 2021).

Despite this, signs of normative disruption are emerging. Curricular changes that incorporate sustainable development goals and planetary health, the emergence of hybrid practitioner roles, lay-user collaboration, and digital innovations like telehealth are also dissolving long-held boundaries around what constitutes professional scope. The formerly rigid wall surrounding physiotherapy practice is becoming more porous, an amoeboid membrane, rather than a fortified border. These changes are taking place against the backdrop of three major systemic pressures: the atomization of health and the body under late-stage capitalism; growing skepticism toward professional authority; and the disruptive rise of digital technologies (Greenhalgh, Howick, and Maskrey, 2014; Nicholls, 2022a; Osimani and Mignini, 2015). Taken together, they challenge the viability of traditional frameworks and force us to reconsider the assumptions on which physiotherapy practice rests.

To adapt meaningfully in this new landscape, physiotherapy must reimagine itself in ways that can embrace complexity, emergence, and ecological entanglement – thinking with, rather than against, the relational and material entanglements that shape both human and non-human life and rethinking care accordingly.

The ontological, epistemological, and normative assumptions discussed thus far continue to shape how physiotherapy understands bodies, health, and care. While there are signs of disruption, they remain embedded in a model that ultimately privileges stability, standardization, and human centrality. What might it mean to think otherwise? To conceptualize health not as a fixed state or normative ideal, but as a dynamic capacity for interaction within an entangled world of bodies, environments, and relations? In what follows, we turn to Deleuze and Guattari's concept of *ethology* – an alternative metaphysical framework that foregrounds becoming, affect, and the ecological capacities of all beings.

The case for metaphysics

Metaphysics, as A.W. Moore describes, is “the most general attempt to make sense of things” (Moore, 2012, p.1). Far from being an abstract exercise, metaphysical thinking shapes how we interpret reality, structure knowledge, and engage with the world. Moore suggests three central questions that often define metaphysical inquiry:

The transcendence question – Can we make sense of transcendent things, or are we limited to the immanent?

The novelty question – Is radically new sense-making possible, or are we confined to established frameworks?

The creativity question – Can we create new ways of making sense, or are we bound to discover the sense things already carry? (Moore, 2012, p9)

These questions offer a lens through which to examine how metaphysical assumptions, whether implicit or explicit, entangle with clinical norms, research methods, and therapeutic practices. They do not sit “above” practice, as if determining it from a distance, but are dynamically co-constituted through the values, models, and logics that shape how physiotherapy thinks and acts.

Physiotherapy, like much of Western healthcare, inherits a metaphysical orientation grounded in essentialism, transcendence, and teleology, philosophical commitments rooted in classical Greek thought. The word “physiotherapy” itself comes from the Greek *phusis* (nature) and *therapia* (healing), linking the profession directly to traditions of natural philosophy (Ruscoe et al, 2024). From Plato and Aristotle onward, Western

metaphysics has often assumed that entities possess fixed essences, that reality is shaped by causes beyond material life, and that all beings strive toward a given end or purpose.

Essentialism assumes that things have stable, discoverable identities or essences, from which all properties flow. Aristotle's taxonomy of living beings, dividing them into genera, species, and individuals, exemplifies this worldview. Modern classification systems, such as the ICD-10, continue this logic, offering representations that abstract from the intensive, lived variability of bodies (Kendler, Zachar, and Craver, 2011; Scadding, 1996).

Transcendence posits a reality beyond or above the one we experience, a first cause (Aristotle's "unmoved mover"), a realm of ideal Forms (Plato), or a divine agent, that orders and explains the material world. In healthcare, this shows up in metaphors of "underlying mechanisms" or "higher-order control systems" that dictate experience from beyond the body's immediate context (Moore, 2012).

Teleology asserts that entities aim toward inherent goals or ends, an acorn becomes an oak, a chair is meant to be sat upon. In physiotherapy, this often appears in functionalist narratives: muscles are for movement, pain is for protection, treatments are for restoring "normal" function (Moore, 2012).

Although physiotherapy has no single, unified ontology, many of its clinical models continue to echo these metaphysical assumptions. Consider how pain is often framed in the literature: as a signal of threat (Schlitt et al, 2022), a protective mechanism (Hill, 2019), or a deviation from the norm requiring correction (Moseley and Butler, 2015). Despite claims to adopt more nuanced perspectives, many approaches remain neurocentric, locating pain in the brain and interpreting peripheral signals through a top-down lens of physicalist reductionism. This reinforces a transcendent, essentialist view of health that centers human cognition and control.

Even within the biopsychosocial model, the plurality of metaphysical orientations is criticized for its vagueness and struggle to gain purchase (Bolton and Gillett, 2019). Person-centered care continues to treat the person as an autonomous unit, abstracted from ecological and planetary conditions (Bolton and Gillett, 2019). The result is a metaphysical landscape that remains dominated by anthropocentrism, transcendence, and static categorization, a worldview ill-equipped to engage with the complexity, fluidity, and ecological entanglement of 21st-century health.

If physiotherapy is to remain relevant, indeed, if it is to have anything to say about the coming crises of

climate change, chronicity, multi-morbidity, and ecological considerations of health – it must reimagine its metaphysical foundations. This does not mean discarding current practice but rather rethinking the conditions under which practices are shaped and made intelligible. This is not only about expanding the field of view of health, but also to enable physiotherapists to develop practices that are more attuned to preventative and public health spheres. To do so, we turn to a radically different metaphysical tradition, one grounded in immanence, relationality, and affect: the ethology of Deleuze and Guattari (1987).

The plane of Nature according to Gilles Deleuze and Félix Guattari Deleuze and Guattari's philosophy offers a radical alternative to conventional metaphysical models. Rejecting transcendence, essentialism, idealism, and teleology, they ground their metaphysics in immanence, relationality, and affect, a perspective they describe as the plane of consistency, or the plane of nature (Deleuze, 1988; Deleuze and Guattari, 1991).

In *A Thousand Plateaus*, they write:

A body can be anything; it can be an animal, a body of sounds, a mind or an idea; it can be a linguistic corpus, a social body, a collectivity ... The longitudes and latitudes together constitute Nature, the plane of immanence or consistency, which is always variable and is constantly being altered, composed and recomposed, by individuals and collectivities. (Deleuze and Guattari, 1987, p. 60)

This plane of nature includes all entities – animate and inanimate, biological and technological, individual and collective. It is not external to the world or reducible to it. Unlike transcendent models of reality (e.g. Platonic Forms or Aristotelian telos), the plane of nature contains no "outside," no governing principle or essence beyond the web of dynamic relations that compose reality.

To be part of nature, according to Deleuze and Guattari, an entity must have the capacity to affect and be affected. A bird belongs to the plane of nature not simply because it is alive, but because it modifies and is modified by soil, air, worms, trees, and other birds. A phone charger is part of nature because it interacts with sockets, devices, human users, and wider infrastructures. The sun is part of nature because it affects flowers, skin, solar panels, and ocean currents (Deleuze, 1988; Deleuze and Guattari, 1991).

Importantly, nature is not governed by hidden causes or purposes. The plane of nature recognizes no essence, no final cause, and no preexisting goal. Rather, every entity emerges as a multiplicity, a unique configuration

of affective relations, brought into being through its encounters with other entities.

To understand an entity's existence on this plane, Deleuze and Guattari propose that each one can be mapped along two dimensions: longitude and latitude.

Longitude refers to the set of relations that constitute the entity. These are not just the parts that exist internally to a body, but any other entities, internal and external, that enter into composition with it. For example, a human's gallbladder and lungs are part of their body, but so too are the phone, chair, or book that shape what they can do and become.

"We call the longitude of a body the particle aggregates belonging to that body in a given relation ... These aggregates are part of each other depending on the composition of the relation that defines the individuated assemblage of the body". (Deleuze, 1988, p. 299)

Latitude, by contrast, refers to an entity's affective capacities: what it can do, what it can become, its power to act and to be acted upon. These capacities are dynamic and variable in keeping with its longitude and its powers to act. A body's latitude changes as it enters into new relations or loses old ones. A person who loses a kidney or a job also loses capacities for certain actions. A forest that loses its trees and wildlife to deforestation no longer holds the same powers, it is, in effect, a different body.

"To every relation of movement and rest, speed and slowness grouping together an infinity of parts, there corresponds a degree of power". (Deleuze, 1988, p. 299)

A body's capacities are not only determined by what it encounters, but how and when it encounters it. Speed, order, and sequence matter. A tree sapling that meets insects, fungi, or animals too early may be destroyed. If those same encounters happen later, they may be symbiotic or protective. A sudden flood of sunlight might scorch a plant, while a slower increase in exposure might help it thrive. The conditions of movement, rest, and timing shape the body's affective powers.

In this framework, a body is not defined by what it is, but by what it can do. There is no stable identity or inherent function, only the ongoing composition and recomposition of relations. A body's identity is not a set of properties but a map of capacities – the ways it affects and is affected by other bodies on the plane of nature. These dynamic, relational assemblages are what Deleuze and Guattari refer to as *agencements* (assemblages).

The plane of nature is not a system of fixed categories or ideal forms. It is an immanent field of irreducible, relational multiplicities, each defined by its longitude (the relations that compose it) and latitude (its powers

and affective capacities). This is a world of becoming, not being, of composition, not classification.

It is in this context that Deleuze and Guattari propose a new approach for understanding bodies – not by what they are, but by what they can do. The name they give to this practice is *ethology*.

PhysioEthological analysis: Composing capacities on the plane of immanence

Deleuze and Guattari's ethology provides a radical departure from dominant biomedical and humanist models of health. Rather than focusing on identity, essence, or dysfunction, ethology concerns itself with the capacities of bodies, their power to affect and be affected. In *Spinoza: Practical Philosophy*, Deleuze (1988), p. 125) defines ethology as "*the study of the relations of speed and slowness, of the capacities for affecting and being affected that characterise each thing.*" It is not a taxonomy of fixed traits, but a cartographic method for tracing how a body moves, changes, composes, or decomposes in relation to others.

This framework offers physiotherapy a profound ontological reorientation. Under an ethological lens, bodies, human and non-human alike, are not discrete, self-contained units but dynamic assemblages. Each is defined by its latitude (its affective capacity at a given moment) and its longitude (the composition of internal and external relations that form it) (Deleuze, 1988, p. 299; Deleuze and Guattari, 1987, p. 60). A physiotherapeutic practice informed by ethology would not begin with what a body is, nor with what it lacks, but with what it can do in any given assemblage – what it becomes through its relations.

Much of contemporary physiotherapy practice is framed through diagnostic and normative paradigms. Bodies are assessed according to functional baselines, mechanical dysfunctions, or psychosocial stressors. Holistic models such as the biopsychosocial models, the subject of care is treated to be an autonomous individual whose health is a function of internal balance or adjustment influenced by biological, psychological and social formations. This view reinforces an anthropocentric and largely homeostatic mechanism: a body is healthy when it returns to its prior state, and therapeutic intervention is directed toward restoring that norm.

Ethology reframes this logic. Rather than interpreting dysfunction as deviation, it begins from the composition of forces present in the situation and asks how these forces constrain or enable virtual possibilities. What affects are present? What relations are composing or decomposing? What new compositions are possible? In this framework, the clinic is not simply a site for

correction but a zone of experimentation where bodies, tools, environments, and timescales intersect to produce new capacities. The location of the clinic therefore is not confined to a hospital or health center, there are endless opportunities that shape therapeutic encounters.

To apply this to physiotherapy requires shifting the clinical gaze from the body as machine to the body amongst fields of the virtual. Consider, for instance, a rehabilitation setting. Traditionally, the human patient is at the center of analysis, and the goal is to restore prior function. An ethological approach, by contrast, would not isolate the human subject from the environment but treat the situation as an assemblage composed of multiple interacting bodies: the floor texture, plinth, bed, air humidity, design aesthetic, ambient sound, temperature, institutional policies, access to sunlight, and more. Each of these elements contributes to the affective landscape of what a body can do at that moment. This is not a metaphorical use of “body.” A non-human object, a prosthetic limb, a stretch of flooring, a tree, or a dog may equally constitute part of the assemblage, shaping the relational field. The body’s function is not purely internal; it is relational. What a body becomes depends on its encounters with others.

Ethology and the event

For Deleuze and Guattari, an event is not a singular occurrence located in space-time, nor is it indexed to a particular subject or cause. Rather, it is a transformation in the field of relations, a threshold crossed, a new composition formed (Deleuze, 1993). As Zourabichvili (2012) argues, the event operates within Aion, a temporal mode in which past and future fold into the present, enabling new modes of becoming. Events are incorporeal, impersonal, and virtual, they are not things that happen to someone but changes in what bodies can do (Deleuze, 2015).

This view of the event has significant implications for how we think about health and injury. A conventional clinical account might explain an episode of tetanus by tracing its origin to a wound, a missed vaccination, or a prior phobia. But from an ethological perspective, the event cannot be reduced to a chain of causes or decisions. It emerges from a broader assemblage: soil bacteria, immune systems, institutional protocols, health literacy, urban infrastructures, weather patterns, public funding cuts, fear of needles, and childhood memories. None of these are incidental; they compose and decompose within a relational field in which events unfold.

Such a perspective resists individualizing tendencies. The analytical process is not to localize responsibility or

isolate variables but to map the intensive movements that form the event. Ethological analysis is concerned with the thresholds that enable or block transformation. What new relations became possible? What forces converged or dissipated? How did this assemblage alter the capacities of the bodies involved?

Ethology, then, offers more than a theoretical concept. It provides a method, one that is not prescriptive, but cartographic. The ethologist maps the affective topology of an assemblage. What components, extensions or relations co-exist? What speeds are these operating here? What affects circulate? What powers are assembled and at what thresholds do they shift? What capacities are operating in this context at this moment and what possibilities might there be?

This approach has practical implications for physiotherapy. Rather than assuming a normative trajectory for recovery or functionality, the ethological practitioner would begin by asking: What can this body do now? What affects stabilize or destabilize its capacities? What relations might be added, subtracted or re-shaped to change those capacities?

For instance, a body may gain strength not through exercise alone, but through engagements with its relation to the environment: light, ambient noise, smoother transitions between movement and rest. A therapy space may gain capacity not through added equipment but by altering patterns of access, timing, or rhythm. An encounter with a refreshing breeze, a woodturning tool, a gravel path in a forested area, a slope, a pony, a railing may be irrelevant in one context and transformative in another. These are not secondary variables, they are integral to the field of affective composition.

In this sense, physiotherapists do not work on bodies as stable entities but as co-composing with assemblages. Care becomes less about implementing pre-given plans and more about crafting with new relations. What bodies become, in this view, is not correction, or re-orientation toward a norm, but the chance to become something else, however small, temporary, or contingent that becoming might be.

Perhaps most significantly, ethology breaks open the anthropocentric frame that continues to dominate physiotherapy discourse. The body is no longer the bounded, individual human, but a node within a wider ecology of relation. Trees, ventilation systems, waiting rooms, birdsong, mold spores, hospital windows, insurance forms, digital devices, all have capacities to affect and be affected. Each contributes to what a clinical encounter is, and what it can become. In this way, ethology aligns closely with planetary health and environmental physiotherapy (Maric, Plaisant, and Richter, 2024; Nicholls,

2022a). It situates care within an ecological ontology: not as something we do to bodies, but as a practice of composing with the world. Ethology re-orientes physiotherapy from the correction of impairment to the cultivation of new powers for collective becoming.

As Deleuze and Guattari argue, to think in terms of affect and relation is not to lose clinical rigor but to open the profession to its planetary possibilities. The clinic, the practitioner, and the patient are no longer isolated agents but elements in a broader system of immanence. Health becomes a question not of balance, but of configuration, what is made possible in this moment, through these encounters, in this field of life.

Sensing movement otherwise: Embodied perception beyond representation

Physiotherapists are trained to perceive movement, yet much of physiotherapy practice remains oriented around stasis – toward capturing, measuring, and categorizing the body through standardized forms. Visual analogue scales, body charts, and classification systems produce representations that appear stable, knowable, and measurable. But what is left out of this view?

Much of what guides clinical practice leans on a representational empiricism: the assumption that knowledge arises from the frequent, the repeated, the observable. This tendency owes much to the legacy of David Hume, whose account of causality emphasized the habitual conjunction of events – the regular succession of similar phenomena (Bell, 2009). In this model, causation is not something seen directly, but inferred through repetition: when A is regularly followed by B, we come to expect B. Such frequentism continues to shape clinical reasoning, especially when outcomes are interpreted through standardized baselines or expected progressions (Anjum, Copeland and Rocca, 2020).

Yet Deleuze reads Hume quite differently from the dominant tradition. For Deleuze, Hume's real radicalism lies in how he treats identity, not as a given, but as something fabricated by the mind through the fiction of continuity (Bell, 2009). In the Treatise, Hume writes:

To remove this difficulty, let us have recourse to the idea of time or duration. I have already observ'd, that time, in a strict sense, implies succession, and that when we apply its idea to any unchangeable object [i.e., to a unity], 'tis only by a fiction of the imagination, by which the unchangeable object is suppos'd to participate of the changes of the co-existent objects, and in particular that of our perceptions. This fiction of the imagination almost universally takes place; and 'tis by means of it, that a single object, plac'd before us, and survey'd for any

time without discovering in it any interruption or variation, is able to give us a notion of identity. (Hume, 1978)

This is a subtle but profound move. Hume here suggests that what we call "identity" is not derived from the object itself, but from an imaginative synthesis. The object appears to remain the same, not because it is essentially so, but because our perception constructs that continuity by relating it to other co-existent changes. In Deleuze's reading, identity emerges through a process of becoming, not from a stable essence. There is no self-same object persisting over time, only a repetition that produces a perception of sameness (Bell, 2009).

This reorientation opens the door to an alternative kind of empiricism. Rather than seeking the general through repetition, a Deleuzian empiricism is attuned to the singular, the intensive, the new, through a repetition of difference. And here, Bergson's influence becomes vital (Deleuze, 1991). For Bergson, true empiricism is not analytical but *intuitive*, an attempt to enter into the singular life of a phenomenon rather than stand outside it. As he writes:

The kind of intellectual sympathy by which one places oneself within an object in order to coincide with what is unique in it, and consequently inexpressible. (Bergson, 1912, pp. 23–24)

This intuition is not mystical, it is a method. It demands an attunement to movement, rhythm, variation, and affect. For Deleuze and Guattari, this kind of attention is the basis for any schizoanalytic or ethological practice:

Make a rhizome. . . But you don't know what you can make a rhizome with, you don't know which subterranean stem is effectively going to make a rhizome. . . So experiment. (Deleuze and Guattari, 1987, p. 251)

To sense movement otherwise is to sense becoming, to orient practice not around identities, norms, or outcomes, but around emergent capacities. It is to begin not with diagnosis but with experimentation: to feel for what is shifting, not only in the body of the patient, but in the assemblage as a whole. This includes inanimate and non-human elements, institutional timings, environmental cues, and affective intensities. This is not to downplay or reject diagnosis. It is to view diagnosis as processes which continue to be important as a means to enable communication, understand pathogenesis, and as an unfolding of a multiplicity of symptom manifestation. Diagnosis has been a key contributor to how healthcare has been successful in treating communicable diseases, but in our contemporary challenges of non-communicable diseases that are impacted by the interactions of multimorbidity, multispecies interaction,

globalization, and climate change the provision of static diagnoses are limiting (Maric and Nicholls, 2022).

Such an ethological sensitivity is not reducible to protocol whereby the static diagnosis starts and the steps follow. It starts in the middle. It recognizes that identity, health, and function are always assembled, always in motion, and always partial. To work ethologically is to ask: What is this body capable of here, now, in this composition? What new relations might be made? What subtle variations are taking place? In this way, movement is not merely observed – it is participated in. This is not to suggest prioritizing intuition over analysis but to weigh both equally.

Discussion

This paper has argued that Deleuze and Guattari's ethology offers a compelling metaphysical and methodological alternative for physiotherapy—one that responds to the limits of diagnostic logics, anthropocentric models of care, and the static frameworks of representation. Ethology invites a reorientation from what bodies are to what they can do, from fixed identities to mobile capacities, from abstract categories to affective compositions emergent in complex ecological fields.

Why this relational approach, and not others? While relational ontologies such as Actor-Network Theory (Latour, 1987) provide important frameworks of analysis they risk *overmining* (Harman, 2013) by reducing entities entirely to their relations, leaving no reserve from which novelty or change might emerge. Ethology, by contrast insist that bodies harbor excess capacities, not fully legible, not exhaustible by any single assemblage, awaiting activation or suppression through encounters (Deleuze and Guattari, 1987).

As they write:

This kind of study is called ethology... [Look] for the active and passive affects of which the animal is capable in the individuated assemblage of which it is a part. (Deleuze and Guattari, 1987, p. 257)

The canonical example that Deleuze and Guattari use is that of the tick, responsive only to light, mammalian odor, and heat, illustrates this vividly. The tick's life is structured not by species-level abstraction, but by three concrete affects (Deleuze and Guattari, 1987). Outside those affective thresholds, it is unresponsive. Its ethological world is minimal, but not less rich for it.

This ethological orientation offers a crucial reframing for clinical practice. Physiotherapy remains anchored to anthropocentric diagnostics and hierarchical taxonomies: treating the bounded human body as the site of intervention. This limits the profession's

ability to perceive and act ecologically. If affect is primary, and the pertinent question is what can this assemblage do now, then we must learn to sense otherwise.

Consider a person gardening. A sudden burst of birdsong alters their rhythm, altering their relational environment and affecting mood and anxiety (Ferraro et al, 2020; Stobbe, Sundermann, Ascone, and Kühn, 2022). A gust of wind changes their stance; the irregular path, lined with moss and uneven stone, compels new patterns of proprioception, with engagement that change physiology (e.g. reduce blood pressure Coventry et al, 2021). Movement within and between entities in this ecosystem alters capacities, affecting health attributes (Soga, Gaston, and Yamaura, 2016). These are not background conditions but are active co-constituents of the encounter. The patient's body becomes otherwise not through the activity alone, but through a composition of light, sound, soil, air, and microbial presence (Maric and Nicholls, 2022; Nicholls, 2022a). Or imagine the repurposing of a disused greenhouse. The nutrient content in the soil, condensation on glass, and buzz of pollinators all shape the capacities of bodies within that space. Here, therapy becomes less about correcting deviation and more about fostering new compositions, the greenhouse is not merely a setting but a participant (Nicholls, 2017, 2022a). These examples demonstrate the change from function to affect, from restoration to co-constitution. They are ecological, multispecies, and planetary in implication.

This perspective invites us to rethink classification itself. As Deleuze and Guattari suggest, a racehorse may differ more from a workhorse than the workhorse does from an ox – not due to biology, but due to the relations and tasks that shape their capacities. A workhorse and an ox, composed of strength and endurance, share more than the racehorse, who is closer in capacity to a greyhound: both shaped for speed and agility. Classification in ethology, then, maps affects and powers, not static morphological traits.

For physiotherapists, this means engaging across the plane of nature – across species, geographies, abilities, and environments. Rather than grouping patients by diagnostic label, practitioners might orient toward ecological constellations of capacity: how movement, rest, and relation co-constitute therapeutic possibility.

Taken together, these arguments offer three interwoven contributions to physiotherapy. First, they reframe bodies as affective compositions capable of becoming otherwise. Second, they propose a method of practice centered on ecological co-constitution over diagnostic restoration. Third, they suggest pedagogical strategies

for cultivating this ethological orientation in clinical education.

How, then, might physiotherapists conceptualize and practice such change?

Physiotherapy could be reimagined around affective taxonomies. Patients might be grouped not by pathology but by ecological configurations, using an immanent, relational logic. Such an ethological reorientation also has profound pedagogical implications. Dominant training paradigms still privilege individualized, mechanistic, and human-centered frameworks. Standards define expertise through diagnostic precision and linear, evidence-based protocols. While these may gesture toward holism, they remain rooted in bio-reductionist assumptions that isolate the body from its ecological and planetary entanglements.

An ethological pedagogy would ask students not merely to assess human related dysfunction, but to evaluate the composition and de-composition of relations recognizing difference. It would orient them to shifting rhythms, nonhuman cues, and more-than-clinical relations. This rupture from representation requires engagement, time, humility, and experimentation.

If physiotherapy is to remain meaningful amid climate crisis, biodiversity loss, and socio-material transformation, it must move beyond models of rehabilitation toward a practice of ecological co-constitution. Ethology offers such a method. It is not prescriptive. It attunes to what bodies, environments, and relations might become, and asks how we might move with them.

Case example: PhysioEthology in motion

The following case example is speculative and imagined, as this theory paper aims toward seeing the possibilities that such an approach may offer and is very much a preliminary sketch. However, it is reflective of some of the contemporary challenges that healthcare practitioners face. This is an example that is at a local scale but could be applied at different scales (e.g. micro, meso and macro) accordingly.

Situation

A fictionalized seaside town, economically reliant on seasonal tourism, becomes host to a transient yet enduring community of people experiencing homelessness. During winter months, environmental hardship collides with economic deprivation, leaving individuals to inhabit peripheral spaces: tents, gardens, disused buildings. These lives unfold on the border of visibility,

stigmatized, systemically neglected, and shaped by narratives of disorder and disposability. Cumulative waste and plastics are strewn across the local landscape as there are no places to dispose of refuse. Despite urgent health needs, this population engages with traditional healthcare services only when individuals are in crisis with high attendance to the emergency department (Reilly, Hassanally, Budd, and Mercer, 2020). However, outside of the urgent care, they often record low attendance rates for health-related appointments which is not a matter of individual noncompliance but of profound disconnection from the relational, temporal, and material affordances of institutional care (Barakat and Konstantinidis, 2023; Braaten et al, 2021; Mwoka et al, 2021).

Background

The town is emblematic of broader systemic ruptures: post-global financial crisis and peri-Covid austerity, housing unaffordability, and fragmented social infrastructure. Care remains tethered to anthropocentric, biomedical models and neoliberal practices which presume an autonomous, compliant, and temporally regulated subject – a patient who can arrive, speak, and comply. This idealized body is absent here. Instead, what emerges is a rupture in relation: between shelter and warmth, food and access, financial income, land and law, care and environment. Clinical frameworks isolate individual variables; they do not register the entangled forces shaping the health of bodies, particularly those in precarity.

Analysis

Longitude: The homeless bodies are situated within dense assemblages – composed of not only the people experiencing homelessness, but the social judgments of the local population, policy frictions with local council members, waste infrastructure management, animal encounters, weather exposure and zoning laws. Any connection to healthcare services is challenging, this is not because care is refused, but that it cannot arrive or to be easily navigated toward. These configurations limit the emergence of therapeutic relations to manifest. In other words, the connections that the homeless assemblage are so disparate, that they are held from their acting.

Latitude: The people experiencing homelessness affective capacities, to eat, to rest, to shelter and feel safe, to move are constrained by environmental precarity, social stigma, economic poverty and relational scarcity. This is not merely a lack of material resources, but

affective, social, participatory and sensory: the chill of wet soil and sand; the disruptive noise of traffic (Stobbe, Sundermann, Ascone and Kühn, 2022) countered by the therapeutic visual and audible sounds of the sea (White et al, 2020) disorientation of changing light and air, the shelter afforded by the cliffside or the pier. These non-human agents shape the collective houseless body's readiness to act or be acted upon. In addition, the political body's power is held in tension, in the one hand is responsible for providing social support with limited financial resources but on the other, held to account by the social opinion of local constituents who grow tired of the appearance, noise and stigma associated with the homeless inhabitants.

Temporality: In ethology, transformation is not pre-determined – it occurs in moments of affective shift. A breeze, a birdcall, a sudden warmth may change the entire assemblage. Intervention unfolds in rhythmic synchrony, not linear prescription. Factors like circadian divergence where entities pattern of engagement change. For example, fragmented sleep changes a person's capacity to engage in social relations alongside asynchronous hunger. Any form of temporal dislocation where the engagement of any body, thing or animal is out of synchrony with others matter. They are not dysfunctions, but expressions of the body's entanglement with its environment. Ethology is sensitive in attuning to the temporal thresholds that shape capacities to act and be acted upon.

A multiplicity of approaches

A PhysioEthological practice does not aim to restore normativity. Instead, it engages with relations across human and non-human fields, creating conditions in which new capacities can emerge. This requires a fundamental move from treatment *of* to attunement *with*, and from adherence to protocol to a situated mapping of engagements and their capacities to act.

What follows here are some of the possible tools for analysis and encounters toward forms of intervention:

Cartography: The construction of maps drawn out that are more than a means of location but also reflect the various bodies capacities alongside their powers to act. One way could be through using a vector model (Low, 2017) but instead of situating the powers that are theorized to be part of an individual person, in this context here there is a wider sphere of view encompassing an ecological perspective. The vector model evokes a dispositional view of causation that is out of scope for this article but has been applied in a process-based ontology used in biology elsewhere (Anjum and Mumford, 2018) and could be applied to this context

in an area for future research. The map could chart various capacities to inform not only where care might happen, but when.

Socioecological integration: This approach would demand collaboration between multiple interdependent agencies such as charity aid groups, urban developers, horticulturists, housing networks, and local councils, and healthcare providers in third sector, primary and secondary care providers, to cultivate dispersed micro-sites of care. Gardens, shelters, shaded alcoves, and food stations become ecotones – sites where human and non-human relations coalesce in support of more-than-human healthcare.

Co-composed practices: Even a traditional perspective of physiotherapy could engage with their skillset and current practices – using walking as foraging, gardening as movement, resting in warmth, hiking and litter picking. Working in an intersectional fashion would enhance physiotherapists scope of practice beyond the financial rewards of biomedical practices. Novel practices could co-arise through the environment, not apart from it. Interventions are not prescribed but become co-generated.

More-than-human participation: One step is maintaining a vision that is open to engagement with more-than-human participants of health. Asking the questions of what materials, entities, movements are in connection, or not. For example, shelter materials, airflow, terrain, waste, birds, odors, and textures, nutritious soil, clean water access, waste management environment processes, are co-constitutors of a health assemblage. These agents shape the health assemblage's capacity with greater degrees of power as human ones. Acknowledging their influence is foundational to this situated practice.

Temporal sensitivity: Engaging in ethology requires an alertness to time. This may emerge through observation and lived experience of rhythms, such as shifts in weather, institutional cycles of change, circadian flows, or points of safety and risk. It also involves an embodied sensitivity to spatiotemporal relations: knowing when to arrive because a body is ready, when the space is quiet, when the light has softened. These encounters are not scheduled by clocks but arrive through thresholds.

Conclusion

An animal, a thing, is never separable from its relations with the world.

Deleuze (1988), p125)

This article has proposed an ethological approach to physiotherapy-one that reorients the profession toward

ecological and affective entanglement. Every act of care is embedded in broader networks of life; environments are not backdrops, but co-constituents of therapeutic possibility. From this perspective, planetary health is not a distant or abstract concern – it is intrinsic to the mobile, interdependent web of life in which all bodies participate.

Health is not contained within the individual, population, or species. It emerges from dynamic, multispecies relations across human and non-human, animate and inanimate. In such a view, a change in soil quality or atmospheric composition may shape a patient's capacities as much as any clinical technique. This is not to displace the human, but to resituate it within an ecological continuum.

This paper offers a sketch of one possible approach among many, and clearly, much more remains to be done. Future research might explore the political and material entanglements of therapeutic assemblages, the intersections of science, art, and philosophy, the indeterminacies and mapping of affect. While such inquiries lie beyond the scope of this paper, they offer opportunities to further evolve the future of physical therapies through continued theoretical and empirical development.

What becomes clear is that the physical therapies, like all practices, are entangled with the conditions of planetary life. This is not about acting on behalf of others but moving with others, recognizing that we co-compose worlds with and through the more-than-human. An ethological physiotherapy would not prioritize narrow human concerns but would instead support shared capacities for engagement.

This is not a call to action, but an invitation to rethink the grounds of practice. By attending to affect, relation, and ecological motion, physiotherapy can position itself as an important thread within a rich planetary tapestry – responsive, experimental, and open to becoming otherwise.

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