

**Phenomenological physiotherapy:  
extending the concept of bodily intentionality**

Jan HALÁK & Petr KŘÍŽ

Palacký University Olomouc, Czech Republic

**Abstract**

This study clarifies the need for a renewed account of the body in physiotherapy to fill sizeable gaps between physiotherapeutic theory and practice. Physiotherapists are trained to approach bodily functioning from an objectivist perspective; however, their therapeutic interactions with patients are not limited to the provision of natural-scientific explanations. Physiotherapists' practice corresponds well to theorization of the body as the bearer of original bodily intentionality, as outlined by Merleau-Ponty and elaborated upon by enactivists. We clarify how physiotherapeutic practice corroborates Merleau-Ponty's critical arguments against objectivist interpretations of the body; particularly, his analyses demonstrate that norms of optimal corporeal functioning are highly individual and variable in time and thus do not directly depend on generic physiological structures. In practice, objectively measurable physical deviations rarely correspond to specific subjective difficulties and, similarly, patients' reflective insights into their own motor deficiencies do not necessarily produce meaningful motor improvements. Physiotherapeutic procedures can be understood neither as mechanical manipulations of patients' machine-like bodies by experts nor as a process of such manipulation by way of instructing patients' explicit conscious awareness. Rather, physiotherapeutic practice and theory can benefit from the philosophical interpretation of motor disorders as modifications of bodily intentionality. Consequently, motor performances addressed in physiotherapy are interpreted as relational features of a living organism coupled with its environment, and motor disorders are approached as failures to optimally manage the motor requirements of a given situation owing to a relative loss of the capacity to structure one's relation with their environment through motor action. Building on this, we argue that the process of physiotherapy is most effective when understood as a bodily interaction to guide patients toward discovering better ways of grasping a situation as meaningful through bodily postures and movements.

## 1. Introduction

This study critically analyzes the theoretical framework currently used in physiotherapy and explains theoretical and practical benefits physiotherapy can acquire by drawing on phenomenological philosophy. Undoubtedly, physiotherapy is a practical discipline wherein practitioners interact with the concrete bodies of others toward alleviating their physical and experiential difficulties in coping with daily life requirements. Concrete physiotherapeutical interventions are largely based on physiotherapists' practical know-how and experience. However, physiotherapists' concrete interventions are necessarily grounded in general theoretical frameworks closely linked to the development of Western medicine and to our historically constituted scientific examination of the world. We address fundamental limitations of current theoretical understanding of the body and embodied action in the context of physiotherapy and explain how physiotherapy can be transformed by considering philosophical insights that are not commonly considered in Western medicine.

Several physiotherapy theorists have outlined how phenomenology and embodied cognition theories could be applied to physiotherapy. Consistently, our study describes how physiotherapeutical practices can be transformed by focusing on meaningful relationships with the environment at the level of movements and bodily postures. We elaborate on the concept of health as a relational or intentional dimension, as opposed to physical and psychological dimensions or their combination. In contrast to previous studies, we elaborate on Merleau-Ponty's suggestion to understand embodied intentionality as a fundamentally dynamic phenomenon—that is, as a dimension that enhances or loses its structural organization depending on different health contexts.

Beyond physiotherapy, we contribute to other domains of knowledge. We do not aim for a mere *application* of phenomenological insights obtained independently of science and experimental empirical enquiry; rather, we adhere to Merleau-Ponty's approach to phenomenology, according to which the relation between philosophy and (natural-scientific) empirical investigation is fundamentally circular (Merleau-Ponty 2020, 112–113; cf. Zahavi 2019b, 129–131; Varela, Thompson, and Rosch 2016, 3–4). We thereby strive for a “mutual illumination” of philosophy and physiotherapy (Gallagher 2003; cf. Gallagher and Zahavi 2020, 36–37; Zahavi 2019b, 132–135; in the context of medical humanities, cf. Scott-Fordsmand 2020). By analyzing physiotherapeutic problems and situations, we elaborate on the philosophical and cognitive-scientific understanding of embodiment and extend the concept of bodily intentionality to domains in which it has not been discussed. Thus, we provide a model for other health-related domains that closely deal with human embodiment.

In Section 2, we briefly posit the limits of science-based physiotherapeutical interventions. From our perspective, evidence-based research has limited implementation potential because it is disjointed from patients' concrete bodily condition owing to its emphasis on standardization. Con-

trastingly, qualitative empirical research, in which patients' perspectives are considered, lacks proper methodological foundations and does not afford optimal integration of first-person information in physiotherapy. We argue that physiotherapists can increase insight into their theoretical and practical problems and so too their ability to care for patients by drawing on analyses of embodiment, perception, and motor action presented in original phenomenological texts. In Section 3, we consider contemporary philosophical elaborations of Merleau-Ponty's ideas in enactivism to highlight that motor performances addressed in physiotherapy should be interpreted as relational features of a living organism coupled with its environment rather than merely as objective physiological processes or subjective phenomena accessible from within the reflective consciousness. In Section 4, we explore Merleau-Ponty's suggestions for understanding motor intentionality and define key elements of a physiotherapeutic framework based on this concept. We clarify why motor disorders should be interpreted as relative losses of the capacity to structure one's relation with their environment through motor action. Connectedly, we argue that physiotherapy is best understood as an interactive bodily process through which physiotherapists adjust patients' deconstructed motor intentionality through interactive bodily dialogue.

## **2. Background: overview of contemporary theorizations of physiotherapy**

In principle, therapeutic interventions performed under the heading of Western science should take the form of well-reasoned, highly effective applications of explanations of causal bodily functioning most relevant to problems at hand. However, relations between theorizations formulated in the language of contemporary physiology and the most common types of practical interventions are highly ambivalent in the current climate. In this section, we discuss how this situation is reflected in some major drawbacks involved in current empirical research and academic publications on physiotherapy.

### *2.1. Physiotherapy theory and practice lack integrity*

Western medicine's *theoretical framework* builds upon the mechanistic physiology paradigm (Darrason 2015; Edwards 1998; Leder 1990; Savransky and Rosengarten 2016). Correspondingly, in Western countries, physiotherapists understand the body primarily as a physico-chemical system of tissues and substances interconnected by causal relationships (Nicholls and Gibson 2010, Shaw 2012). Consequently, clinical reasoning in physiotherapy approaches patients' bodies as malfunctioning objects or machines that can only be repaired by means of external manipulation of their parts (Øberg et al. 2015, Nicholls et al. 2016). It is generally expected that mechanical manipu-

lations targeting malfunctioning parts will bring them back in compliance with supposedly universal norms of corporeal functioning (Marcum 2005).

The theoretical equipment of physiotherapy primarily comprises a system of knowledge that allows apprentices to disclose various causal relations within the physiological body (Kelly et al. 2019; cf. Green and Hopwood 2015). However, according to all evidence, this ability does not afford design of optimal physiotherapy intervention. First, the many different hypotheses on causal relationships within the body are not always linked. Second, theorists successfully develop new hypotheses without necessarily building on or even accepting older ones. Consequently, different theories are taught at different institutions; yet these different schools of thought all claim to enable optimal intervention. In short, the theoretical paradigm built on causal interaction and mechanical relationships within the body is currently undergoing a crisis.

The more narrowly *practical part of physiotherapeutic education* is even more diverse than the theoretical part. It comprises multitudes of techniques, methods, and concepts usually developed in practice by experienced “masters.”<sup>i</sup> Usually, such techniques are not originally based on the mechanistic paradigm. Rather, they are accepted within the theory only if they are successful in practice. Thus, rather than materializing science-based theoretical insights, the practically tested techniques are continuously transformed into quasi-scientific facts through post-hoc theorizations primarily consisting in their imposition into the abstract language of mechanistic physiology.

This results in paradoxical situations in practice, such as when different techniques based on different and contradictory natural-scientific explanations lead to solving the same physiotherapeutic problem. There is an ongoing discussion on whether children with cerebral neuromotor disturbances should be treated based on the Vojta method or the Bobath concept (D’Avignon et al. 1981, Józwiak et al. 2010; cf. Franki et al. 2012); also, some physiotherapists working with children have moved away from these methods and started exploring the so-called “functional” training or strengthening (Lee et al. 2015, Martin et al. 2010, Franki et al. 2012b).<sup>ii</sup> Although these methods are based on different motor learning theories, they present no significant differences in effectiveness. Conversely, a given bodily dysfunction can typically be attributed to multiple theoretical explanations. Agrawal (2016), Borges et al. (2017), and Alshammari et al. (2019) discuss whether shortened hamstrings should be treated through reciprocal inhibition, post-isometric relaxation, static stretching, or the Kabat method. However, none provide sufficient grounds for deciding which technique to choose or sufficiently explain why a given technique leads to eventual success or failure of the therapeutic process.

Despite their prevalence, such disconnections and incoherencies between theoretical mechanistic explanations and physiotherapists’ everyday decision-making are largely unreflected in aca-

ademic debates on physiotherapy. Academic publications on physiotherapy are dominated by *quantitative empirical research*. In this field, the standard mode of operation is to investigate therapeutic effects of techniques and the diagnostic suitability of specific tests in relation to various body conditions. To fulfill evidence-based medicine requirements, the techniques, tests, and conditions of the body must be standardized; that is, transformed into measurable and comparable items (Morris et al. 2009, Salbach et al. 2011). Such standardization requires researchers to radically reduce the complexity of the processes they describe (Savransky and Rosengarten 2016; cf. Jette et al. 2009, McDonnell et al. 2018). In some cases, conclusions seem reached only at the cost of distorting the statistical methods they claim to apply (Page 2014; cf. Boutron and Ravaud 2018). Quantitative interrogation is limited to isolated questions such as whether in a particular case it is better to opt for one exercise or another (e.g., flexion vs. extension) or how many therapeutic interventions should be recommended (cf., e.g., Larsen et al. 2019, Ojha et al. 2019). The fragmentation of the context of therapeutic intervention inherent in “evidence-based” research on physiotherapy fundamentally hinders physiotherapists’ capability for responding to patients’ needs in concrete bodily interaction and consequently leads to decreased practical efficiency of the subject techniques.

To compensate for the limitations of the dominant quantitative approach to physiotherapy research, there is a growing interest in enquiries based on *qualitative methods*. Herein, academic publications on physiotherapy tend to either refer to phenomenology and its theoretical constructions (Shaw 2012, Øberg et al. 2015, Nicholls 2017) or to engage in some form of “phenomenological” empirical research (Arntzen et al. 2019; Blixt et al. 2019; van der Meide et al. 2018; Skjaerven et al. 2008; Smythe et al. 2012). Physiotherapists’ lively interest in phenomenology converges with developments in several related areas such as sports (Allen-Collinson and Evans 2019), nursing studies (Zahavi and Martiny 2019), and general medicine (Aho and Aho 2008; Crişan and Copoeru 2020; Carel 2010; 2016; Toombs 2012). We agree that phenomenology offers a mode of enquiry that can considerably improve our understanding of phenomena related to human health, physical performance, and physiotherapy. The phenomenological approach makes it possible to shift our perspective from the patient-object to the patient as a subject, whose perceptions and experiences are relevant for the therapeutic process (cf. Zahavi and Loidolt 2021, 17–18). However, researchers’ understandings of the basic concepts and ideas that ostensibly constitute phenomenology vary widely. A closer look into phenomenology from a methodological perspective is vital.

## 2.2. *Physiotherapists’ engagement with phenomenology remains unsatisfactory*

How the phenomenological method should be defined is not settled in literature. Commentators agree that phenomenology is a descriptive rather than speculative endeavor and that it empha-

sizes the need for attending to subjects' experiences as opposed to explaining them away through naturalistic models (Gallagher and Zahavi 2020, 23–34; Zahavi 2019b, 32–43; Moran 2019). However, phenomenology corresponds to a certain stance or attitude rather than a fixed set of theoretical standpoints or methodological prescriptions (Moran 2019, 206; Gallagher and Zahavi 2020, 23). Here, we limit ourselves to identifying three theoretical gaps in the current use of phenomenology in the context of physiotherapy and briefly distinguishing our approach from previous attempts.

Despite the need for variability within phenomenology, there are several important distinctions. The tradition of phenomenology stems from the works of *philosophers* such as Husserl, Heidegger, and Merleau-Ponty. These authors do not perform empirical investigations for the purpose of producing more positive knowledge about specific empirical domains. Rather, they aim to clarify how there can ever be specific types of empirical domains for us and, consequently, to provide a general account of human relation to the world (Gallagher and Zahavi 2020, 36; Moran 2019, 207; Zahavi 2019b, 103).<sup>iii</sup> In phenomenology, investigations of more particular topics such as human consciousness, perception, embodiment, or sociality are subordinated to the more general philosophical goals.

Considering references to phenomenology in qualitative research, some commentators distinguish between “philosophical phenomenology” and “applied” phenomenology (Fernandez and Zahavi 2021; Zahavi 2019b). Qualitative empirical research and phenomenology are both concerned with descriptions of “first-person” lived experiences but have quite different theoretical ambitions and rely on different methodological procedures. For this reason, Zahavi (2020, 4) argues that the first-person descriptions provided by qualitative researchers do not represent a full-fledged appropriation of phenomenology. Regarding the project of “applying” phenomenology, Zahavi (2019b, 137) finds it important “to look beyond the different proposals currently to be found within the qualitative research literature” as there are important theoretical and methodological resources in philosophical phenomenology itself. There is also no agreement on whether the methodological tools currently employed in qualitative empirical research satisfy the criteria for phenomenology determined by its founders and their line (Crişan and Copoeru 2020; Gallagher and Francesconi 2012; Køster and Fernandez 2021; Zahavi 2019a; 2020; 2021; Zahavi and Martiny 2019).<sup>iv</sup>

Academic publications on physiotherapy that refer to phenomenology almost never directly discuss original phenomenological texts; if they do, it is generic. The difference between philosophical phenomenology and qualitative research is typically not considered. Hence, we note a major gap in the current use of phenomenology in the physiotherapeutic context. The scope of “phenomenological” studies on physiotherapy is currently much narrower than what is involved in the

idea of phenomenology. Qualitative research does not take full advantage of what phenomenological philosophy has to offer to physiotherapy and physiotherapeutic theory.

Within qualitative research, there is no consensus on what constitutes a properly phenomenological methodology (Gallagher and Zahavi 2020, 34–55; Finlay 2009; Zahavi 2019a; 2019b, 122–137; 2020). Qualitative researchers in physiotherapy generally employ theoretical models and methodological tools developed by van Manen (2016), Giorgi (2009), or Finlay (2011), which are supposed to help them implement “complicated” philosophical concepts into their empirical studies.<sup>v</sup> As applied to physiotherapy, the key methodological requirements of such studies then typically comprise descriptions and interpretations of probands’ (patients and physiotherapists) reflections, behaviors, or both from interview data. A “phenomenological” terminology used for the interpretations is supposed to shed light on how physiotherapeutical process is experienced by the participants, as opposed to how it is explained by objectivistic studies. Connectedly, it is often presumed that the phenomenological quality of the results depends on the researcher’s ability to go beyond “taken-for-granted understandings” of observed situations and statements (Bjorbaekmo and Mengshoel 2016, 13; referring to Finlay 2011; 2013).

This state of affairs reveals a second theoretical gap in how phenomenology is used in physiotherapy. According to philosophical phenomenologists, to assume that phenomenology is simply a subjective account of one’s experience is mistaken, as phenomenology is rather a general account of (subjective) experience (Gallagher and Zahavi 2020, 24, 32). Similarly, in attempting to bring phenomenology into practice through qualitative research, van Manen finds that his work initiates many works wherein the methodological principles he suggested were “misused and poorly understood” (2017, 776). Among methodological misconceptions purportedly distorting the meaning of phenomenology, van Manen criticizes, in particular, the contention that “phenomenology is the study of how individuals make sense of their own experiences” and that therefore all “study of experience...must be phenomenology” (2017, 776). Unfortunately, ample physiotherapy studies identify themselves as phenomenological using these criteria (Olsen et al. 2016, Eckerholt and Bergland 2019, Hellem and Bruusgaard 2018, Groven and Heggen 2017, Dragesund and Øien 2018, Albertsen et al. 2019, Bertilsson et al. 2020).

The third theoretical gap is closely related to the second one. In fact, van Manen (2017, 776) argues that psychological sense-making and reflection do not constitute phenomenological inquiry because the latter is concerned with more fundamental, that is, prereflective and prepredicative experiences. This claim does not seem to be entirely correct as phenomenology is concerned with both prepredicative and predicative experiences and their mutual relationships. However, van Manen’s comment points to an issue that is vital in the context of physiotherapy. The qualitative data gath-

ered through interviews mostly corresponds to retrospective verbal reflections on individual probands' experiences rather than pertaining to the main object of physiotherapy, the bodily behavior itself. While reflective narratives might bring insights relevant for some purposes, they do not seem to open new ways of understanding prereflective bodily relation to the world and intervening into it through physiotherapy. Correspondingly, qualitative enquiries may allow researchers to link some of the patients' psychological experiences to concepts and ideas developed by phenomenology; however, they typically do not lead to a change in how the therapy is performed.

In sum, physiotherapeutical research that refers to phenomenology typically has the form of a qualitative empirical investigation interpreting particular experiences of particular subjects by means of collecting and interpreting their reflective accounts. Contrastingly, we argue that physiotherapy should use the theoretical resources offered by philosophical phenomenology in the sense of a general theory of human relatedness to the world to investigate the patients' prereflective bodily actions and the possibility of their adjustment.

Finally, we briefly point to the necessity for integrating first-person and third-person approaches. We agree with the qualitative researchers that it is important to approach the patient as a sense-making agent involved in the therapy. However, as physiotherapy deals with embodied subjects who are prereflectively engaged in sensorimotor interactions with the world, it is important to acknowledge that physiotherapeutical interventions cannot be simply *opposed to* physical interventions. That is, by intervening in the "patient-subject," physiotherapy does not deal merely with a psychological subject, but considerably intervenes in the "patient-object" as well. Consequently, a properly phenomenological physiotherapy requires that we *integrate* the first-person and third-person insights, methodologies, and practices, rather than merely opposing them and using them in parallel.

Recently, more integrative approaches have been outlined in psychology and psychiatry (de Haan 2020; Køster and Fernandez 2021; Stanghellini et al. 2019; Zahavi and Loidolt 2021), nursing (Zahavi and Martiny 2019), medical humanities (Kristeva et al. 2018; Scott-Fordsmann 2020), clinical medicine (Stilwell and Harman 2021), and neuropathology (Gallagher and Cole 1995). Even earlier, cognitive scientists and philosophers started exploring the possibilities of how phenomenological or, more generally, human-perspective based investigations can integrate factors commonly studied by empirical science from a third-person detached perspective (e.g., Merleau-Ponty 1963; 2012; Gallagher 2003; Varela, Thompson, and Rosch 2016; for an overview, see Gallagher and Zahavi 2020, 34–50; Zahavi 2019b, 103–140). Similarly, several physiotherapy theorists have recently recognized that a phenomenological theorization of bodily relationships with the world cannot be reduced exclusively to first-person reflective experience as such relationships always involve actual



physical events and subpersonal processes (Arntzen et al 2019, 2; Normann 2018, 5–6; Øberg et. al. 2015, 244–245). These same authors recognize that Merleau-Ponty’s original philosophical writings may enable physiotherapeutic theory to stop merely alternating between third-person mechanistic and first-person narrative accounts or combining them without attempting to provide a sound theoretical explanation of their relation. Our aim now is to take up these efforts and contribute to developing a framework that incorporates factors traditionally reduced to exclusively first- or third-person insights.

### **3. A phenomenological critique of psycho-physical dualism and its implications for physiotherapy**

Several of the problems identified in the previous section can be resolved with the help of Merleau-Ponty’s theoretical framework and recent elaborations on his works in embodied cognition theories and enactivism. While Merleau-Ponty’s works are sometimes cited in philosophically informed physiotherapy research, such references are mostly general and do not seem to produce substantial changes in the theoretical paradigms physiotherapists rely on. Contrastingly, our project of reintroducing Merleau-Ponty into physiotherapeutical theory and practice builds on careful exegetical work with and development of concrete arguments from his texts. This approach makes it possible to enhance physiotherapeutical conceptual framework through Merleau-Ponty’s ideas on how one’s corporeal relationship to the world can be reorganized and structurally enhanced through concrete physiotherapeutic interaction. However, before explaining how Merleau-Ponty’s philosophy can positively inform physiotherapy, in this section, we summarize his most important arguments against objectivistic and subjectivistic explanations of human embodiment.

#### *3.1. The dynamical unity of the living body according to Merleau-Ponty and enactivism*

One of Merleau-Ponty’s fundamental contributions to the philosophy of embodiment consists in showing that it is impossible to explain our bodily relationship to the world by exclusively relying on the concept of causality. As Thompson (2007, 80) states, Merleau-Ponty’s works help us understand why we can “no longer regard life as a mechanism in the classical sense;” that is, as “an arrangement of parts externally related to each other through efficient causal relations.” Developing theoretical implications of empirical investigations from biology, physiology, or neuropathology, Merleau-Ponty (1963, 2003, 2012) described how, between a living organism and its environment, there is no direct determination. A living body, he argues, does not react to what physics and chemistry study as isolated physical and chemical processes, but to *configurations* of stimuli that instantiate vital values for it, such as nutrition or shelter. Consequently, a single behavior may be elicited

by several different objective stimuli while, conversely, a minor change in the objective state of affairs may provoke radical behavior change (Merleau-Ponty 1963, 160–161).

These considerations have vital implications for the attempts to regulate bodily behavior, and for therapeutic efforts. They invite us to stop considering environmental and corporeal objective processes as something that exists in and of itself and to approach them as *relational* phenomena. The value of physical events described by science from a third-person perspective can only be properly assessed through consideration of how they relate to and concretely affect the behavior and experience of the bodily being in question.

By focusing on relations between embodied subjects and their environment, Merleau-Ponty pursues one of the fundamental ambitions of phenomenology: to systematically describe the correlation between the subjectivity and the world experienced by it. Merleau-Ponty also argues that the relational nature of environmental cues and bodily events requires that we discuss them concerning what “meaning” they have for the organism, as opposed to merely determining causal relevance. However, his reference to meaning does not imply that he posits the existence of a universal constituting subjectivity that warrants meaning independent of worldly events. Throughout his works, he criticizes Husserl’s idea of a “bestowal of sense” (*Sinngebung*) and insists that meaning is established interactively (Merleau-Ponty 1968, 180, 243–244; 2012, 461; 2020, 19–20). If an experience has a meaning for an embodied subject rather than being merely the result of external causal events, it is not because the subject projects the meaning on the environment. Consequently, Merleau-Ponty’s phenomenology fundamentally differs from all theories that overlay some of Husserl’s more restrictive requirements on applied disciplines such as medicine (e.g., Crişan and Copoeru 2020; cf. Zahavi 2020; 2021). Similarly, meaning as experienced by an embodied subject does not exactly correspond to a “psychological” reality either. For Merleau-Ponty, the meaning of a stimulus is established through an embodied subject’s concrete relations with its environment. Such relations are a matter not merely of psychological acts of consciousness but of embodied, environmentally, and even materially situated acts such as physical movements. In Merleau-Ponty’s view, living organisms’ relation to meaning can be explained by neither objectivistic nor subjectivistic (psychologistic or transcendentalistic) epistemology.

Merleau-Ponty’s ideas are not merely philosophical speculations based on early 20th century biology. Merleau-Ponty’s thoughts on living organisms were more recently taken up and elaborated upon by embodied cognition theorists and enactivists. Those authors link them to contemporary scientific research on neural pathology, morphogenesis or morphodynamics, and to other theoretical frameworks such as dynamic systems theory (Gallagher 2005; Varela et al. 2016; Thompson 2007; in the context of physiotherapy, Arntzen et al. 2019; Normann 2018). Contemporary embodied cog-

nition theories agree with Merleau-Ponty in that perception is closely interlinked with action, rather than being passive physiological excitation caused by environmental stimuli (O'Reagan and Noë 2001; Noë 2004). For enactivists, a living being constitutes a system of interrelated processes that continually interact with its surroundings to maintain its unity and provide the necessary energetic and material resources (Di Paolo 2005; Thompson 2007; Thompson and Stapleton 2009, Di Paolo and Thompson 2014). Consequently, enactivists follow Merleau-Ponty in understanding sensorimotor actions as relational phenomena. Following this idea, many studies now provide concrete descriptions of how objects afford different kinds of interactions with subjects depending on subjects' attitudes, such as when a cup will afford different types of grips depending on what the subject intends to do with the cup (Pacherie 2018, 381; cf. Gallagher 2001, 150–151; Ansuini et al. 2006, 2008; Ebbesen and Olsen 2018; Jeannerod 1997; Sartori et al. 2011).

Considering this development in philosophy and cognitive science, there are strong reasons for contending that the mechanistic paradigm, still dominant in physiotherapy and physiotherapeutic theorization, is an inadequate basis for understanding the living human body. Next, we illustrate this point through examples of the living body dynamically regulating itself under variable external and internal conditions. In subsequent sections, Merleau-Ponty's general arguments provide a foundation for our account of physiotherapeutic processes.

### *3.2. Merleau-Ponty on the body: transcending causal and psychological explanations*

Merleau-Ponty notes that mechanical damage to the body does not directly lead to loss of a particular type of experience and its corresponding relationship with the environment. Thus, people who lose their hands to traumatic injury do not necessarily have difficulty perceiving and meaningfully relating to what is “handy” or manipulable through the specific sensorimotor capacities of the hand (Merleau-Ponty 2020, 121; cf. Gallagher 2001, 161–164; 2005, 86–106; Weeks et al. 2010). Amputees still relate to their environment as “graspable” or “walkable,” even though the physical parts of their bodies that could fulfill the intention of grasping or walking is no longer available to them (Merleau-Ponty 2012, 78–91). These conditions can, of course, be very distressing for patients. However, at the theoretical level, they illustrate that a single type of experience, such as walking or grasping, can be maintained under multiple different environmental (external) and physiological (internal) circumstances.

Conversely, even if our own biological body is objectively present and physiologically available, we may become incapable of using it. As the experimental postural situation known as the hand reversal illusion illustrates, the two aspects can easily become dissociated (Hong et al. 2012). In that case, unusual intertwinement of the fingers disturbs their typical configuration in syn-

ergic actions and causes subjects to fail to execute simple sensorimotor tasks such as pointing with a specific finger (Merleau-Ponty 2020, 106–107, 109, 111). Merleau-Ponty also discusses more permanent apraxia, such as owing to stroke, traumatic brain injuries, or dementia (2012, 140–142; 2020, 109–117; Katz 2018). Under such conditions, a physically present limb is chronically deintegrated from the subject’s body schema<sup>vi</sup> and altered in its explorative power (Merleau-Ponty 2020, 95–96). The patient understands what they are supposed to do, can formulate it in speech, and their sensorimotor system has preserved the capacity to produce the intended movement; however, this explicit reflective knowledge does not lead to the bodily reorganization that normally makes possible praxic accomplishment of the required task. Analogically, in becoming capable of using a prosthetic limb, it is not enough that it is physically attached to one’s body. One must also “incorporate” it, learn to integrate it into the range of one’s motor behaviors and one’s relationships with the environment (Merleau-Ponty 2012, 144–145; on incorporation, Murray 2004; De Preester and Tsakiris 2009; Standal and Moe 2011; Thompson and Stapleton 2009). Hence, a mere physical presence of the body and the physiological availability of its parts is not a sufficient condition for the subject to experientially rely on them in their pragmatic engagements in the world.

For one’s body to be available for action, the body parts must form a synergic unity dynamically centered on varying practical tasks in the world. When one perceives a marble between one’s thumb and index finger as a single spherical object, it is not only a matter of the objective physical presence of the body sensing the appropriate stimuli but also of the inter-relationship between one’s fingers in their synergic exploration of tactile environments.<sup>vii</sup> Now, the synergies between all segments of the body have a particular relationship with the segments considered in isolation, which sheds light on the difference between a living body related to its meaningful environment and a physical body considered as a causal system. As we have seen, upon establishment of certain types of synergical organizations in the body and consequently the body’s relations with the environment, such relations may be pursued further even if the physical components on which it initially relied (e.g., the physical limbs) become unavailable and must be replaced. This means that a living body is capable of maintaining *relational stability* with its environment despite undergoing important variations on the physical-causal level. To “have” a body thus does not mean, for a living subject, simply being causally connected to certain physical materials; it means having the ability to transpose types of interaction with the environment across variations of internal and external conditions, even in cases where completely different physical means of realization are required.

In short, physical parts of the body are neither simply *causes* of a subject’s experiences nor mere *instruments* through which the subject materializes their purely mental intentions in the physical world. That is, the subject’s intentions and physiological apparatuses must be viewed as ele-

ments of a larger system in which their particular roles depend on the presence and specific quality of all the other elements and on the way, they are synergically configured within a functioning body oriented toward the world. Our goal in the following sections is to demonstrate the importance of these theoretical insights for the physiotherapeutic process.

### *3.3. Mechanistic interventions are insufficient*

The above-outlined interpretation of embodiment has fundamental implications for efforts to produce optimally efficient physiotherapeutical interventions. We argue that clinical reasoning in physiotherapy that is based on causal models is insufficient not merely due to factual limitations, but because the causal models themselves fail to account for a living body's relationships with its environment. We demonstrate this argument by developing the idea presented in the previous section, according to which a living body's meaningful relationship to the world is not immediately correlative to variations in physical-causal bodily factors.

Physiotherapy typically focuses on identifying and measuring alterations in physical tissues that can be categorized as deviations from presumed general norms. However, in common practice, physiotherapists encounter cases in which such deviations do not systematically correlate with the patients' experiential difficulties, even though the difficulties are paradoxically the principal reason for the interventions. For example, a deviation displayed on an X-ray, such as a particular Cobb's angle of scoliosis or a shift of lumbar vertebra, rarely correlates with a specific intensity of low-back pain or other subjective difficulties. One patient with a very pronounced hallux valgus deformity may report a degree of pain and discomfort in the area of the metatarsophalangeal joint similar to that of another patient with an almost insignificant deformity in the same area. Conversely, a given angle of hallux valgus may be associated with intense pain in one case and negligible pain in another. The adjustment of the angle that makes it more conform to the norm may even lead to an increase of pain or discomfort.

As discussed in section (2.1.), quantitative evidence-based studies fail to shed sufficient light on these cases. Although such studies (Menz 2011) identify significant correlations between objective parameters and subjective difficulties, this comes at a cost. Researchers only select a very limited number of objective bodily variables (e.g., the angle of hallux valgus, sex, age, weight) and significantly simplify the subjective values by transposing them onto quantitative scales, such as the visual analog scale. Factors that are relevant for therapy but cannot be easily operationalized are excluded from the study. Attempting to account for more complex factors while also preserving statistical significance, some researchers resort to using a bigger sample. Chang et al. (2020) examine static (standing) and dynamic (walking) pressure distribution in 944 feet with hallux valgus defor-

mity to identify correlations between the pressure and local pain in the foot. Relying on a large sample, they distinguish between several types of deformity and thus explain several differences among the cases. The study still omits other relevant factors, such as the type of shoes used, the general quality of connective tissues, or the patients' lifestyle. However, a patient whose angle of hallux valgus does not considerably deviate from the norm but experiences pain in the area needs to be examined precisely regarding these factors, as well. Evidently, disclosing objective physiological structures and causal relations between them alone does not make possible the design of optimal physiotherapeutic intervention.<sup>viii</sup>

Reacting to the limitations of the mechanistic approach that focuses on physiological deviations, some authors introduce the idea that bodily difficulties should be analyzed regarding bodily *function* or *functionality*. Different conceptual elements are used within different schools of thought. Some physiotherapists speak generally of a “functional approach” (Helders 1999) or a “physiotherapy of function” (Lewit 1994, 2013, 2016), while others refer to “functional motor disorders” (Nielsen et al. 2014, Pringsheim 2016) or “cognitive functional therapy” (O’Sullivan et al. 2018). Although there is no comprehensive definition of “function,” these studies suggest that physiotherapy be focused less on measurable deviations of particular physiological tissues (e.g., the angle of hallux valgus or Cobb’s angle) and more on whether parts of the body fulfill their presumed general function or purpose (e.g., gait, maintaining balance, grasping).

Beyond merely considering pathologies of a given physiological structure considered in isolation, functional approaches also investigate relationships between such structure and a specific bodily operation, in particular in the context of patients’ daily activities. For example, physiotherapists of function consider not only the shape of the femur and pelvis, the range of movement in the hip, or the strength of the hip muscles but also the patient’s capability for maintaining an appropriate position of, for example, the pelvis while performing a particular activity such as standing on one leg. That is, rather than contenting themselves with the analytical approach to the body and the search for specific causes, they proceed more holistically and involve interpreting measurable physiological structures in their behavioral contexts.

However, functional approaches remain attached to a universalistic third-person account of the living body that is typical of the mechanistic paradigm. By referring to “function,” practitioners presuppose objective norms of bodily operation to which they subsequently adapt their diagnoses. Compared to analytical approaches, functional diagnoses are better situated for establishing higher levels of correlation between experiential difficulties and bodily “dysfunctions” to be treated. However, because their conceptual framework is still abstract and universalistic, they fail to consider crucial aspects of embodiment that we have described on Merleau-Ponty’s examples. That is, they

do not consider whether the patient incorporates the meaning of the desired movement into their particular bodily action and, consequently, how well a specific movement fits into their specific relationship with the environment regarding the physiological means they currently possess. As we have seen with Merleau-Ponty, physical structures of one's body do not relate to the subject's interactions with the environment in a strictly functionalist way; rather, in different subjects and at different phases of a subject's history, particular type of meaningful bodily relation to the world (e.g., grasping) are realized with the help of potentially very different physical means.

Hence, the limitations of bottom-up mechanistic and top-down functional types of clinical reasoning are linked to the fact they both remain attached to the causal framework as their paradigmatic interpretative tool. To resolve discrepancies between objective deviations and subjective difficulties, practitioners usually examine adjoining parts of the physical body and construe increasingly complex webs of presumed causes of the observed discrepancies. Hallux valgus, for example, may be linked to a genetic disposition, hormonal setting, shoe shape, the quality of exteroception in the feet, postural activity of the muscles sustaining the arch, postural activity of muscles adjusting rotation of the tibia, and so on. Each such causal factor involves several possible explanations, and as a given subjective condition can always be linked to a *different set* of causal factors, the list of presumed objective causes of a given difficulty stretches on infinitely. Moreover, as each set of causal factors reflects the condition of an individual patient that is variable in time, any attempt at generalizing the causal relationships reported is fundamentally problematic.

Therefore, any eventual success in therapy based exclusively on analysis of mechanistic variables in the body will remain partial and coincidental. Therapeutic intervention aiming exclusively at elimination of objective deviations does not systematically lead to subjective relief because it simply does not allow the physiotherapist to determine the presumed cause of the experiential difficulty. Contrastingly, the phenomenology of embodiment invites us to view the nature of any difficulty as relational. That is, the difficulty pertains to the ways in which physiological structures are related to actions in the environment rather than to an isolable material cause. Objective measurement of a physiological structure of the body does not provide satisfactory insight into the real matter of physiotherapeutic intervention which concerns a living body oriented to the world. As we have seen with Merleau-Ponty and enactivists, a living body should be understood as a subject capable of maintaining a certain relationship to its environment by relying on potentially very different configurations of objective conditions with potential causal values. The subject involved in the physiotherapeutic process is not therefore a body that can be measured and analyzed from the third-person perspective but rather a body capable of acquiring and potentially losing capacity to execute its intentions in the world within variable sets of measurable causal configurations.

### *3.4. Interventions based on conscious control are equally insufficient*

We note the necessity of considering relational stability, the directedness of patients' bodily experiences toward situations that represent vital values for them and are thus meaningful. However, as noted in section (2.2.), this does not imply that physiotherapy addresses patients' conscious awareness of their bodies or environments. A closer look on the issue might be instructive.

Patients may benefit from increased explicit awareness through instructions or demonstrations on manipulating specific parts of their bodies. Opening up to a new coordination, for example, is usually initiated by means of a conscious decision. Similarly, our motor performances are often affected by explicit perceptions, beliefs, and narratives regarding our bodies. A visual perception of one's body can disturb one's motor performance (e.g., hand reversal illusion) or contribute positively to it by stabilizing spatial orientation. Interactions between conscious representations and bodily performances have been studied in a variety of contemporary contexts, including gender differences (e.g., Bordo 2004; Young 1980), expert performances (e.g., Legrand and Ravn 2009; Toner et al. 2016), major body weight changes (Natvik et al. 2019), and illness experience (Stahl 2013). Generally, enactivists speak of interactions between body-schematic motor actions and conscious representations constituting one's body image (Gallagher 2001, 152; 2021; in the context of physiotherapy, Normann 2018).

However, according to both phenomenology and contemporary embodied cognition theorists, the pragmatic system of sensorimotor relationships with the environment is distinct from the system of conscious awareness and that the former is usually functioning without perceptual monitoring or personal control (Gallagher 1986; 2001; 2005; cf. De Preester and Knockaert 2005; Ataria et al. 2021). Similarly, Merleau-Ponty (2012, 123) argues that we do not ordinarily move our bodies in explicit acts of deliberation according to preconceived plans (cf. Dreyfus 2002; Romdenh-Romluc 2007).

Physiotherapists cannot presume that a desired motor pattern will become successfully integrated at the bodily level simply by inciting patients' conscious focus on a mechanical repetition of a verbally explained or passively demonstrated movement. Concrete physiotherapeutic practice confirms that the precision and harmony of our complex motor coordination do not originate from our conscious awareness. Patients who cannot raise their arm above their shoulder level because of inadequate coordination may be instructed to keep the shoulder in a lower-back position and then externally rotate the humerus to increase the range of shoulder flexion. However, this conscious intervention in corporeal coordination usually produces unintended accompanying changes in posture and general muscle tension increase in the corresponding area. Further instructions aimed at pre-



venting such adverse effects usually lead only to different sets of adverse effects. Such instructions merely address explicit representation of the body in patients' consciousness, which does not embrace the complex coordination of a habituated corporeal movement. The movement must be "caught" by the body itself (Merleau-Ponty 2012, 144) without the individual explicitly focusing on their postural coordination and movements.

In contrast to therapeutic intervention based on explicit awareness of the body, verbal instructions, and explicit memorizing of motor drills, phenomenological and enactivist analyses of embodiment suggest that physiotherapeutic intervention should take place primarily at the level of patients' *bodily* relationship to the world and bodily interaction with the therapist. In philosophy, dynamic bodily relation to the world has been described with the help of the concept of *motor intentionality*. Accordingly, we explain the notion of motor intentionality and demonstrate that physiotherapy is best understood as a reorganization thereof.

#### **4. Physiotherapy as a reorganization of bodily intentionality**

##### *4.1. Motor intentionality in Merleau-Ponty and enactivism*

We have seen how one's experiences are embedded in the living body and how, conversely, that body's overall organization cannot be exhaustively described in merely mechanistic or universalistically functional terms, because its interaction with the environment is relational, guided by the meaning a certain range of actions has for an embodied subject. In philosophy, the fact that a subject's experience is directed toward something is referred to as "intentionality." As Joel Krueger explains, consciousness "is a *relational* phenomenon" and intentionality is "a *relational* process through which we stretch outside of ourselves and interact with the world" (2019, 3, 5; cf. Gallagher and Zahavi 2020, 108–136; Zahavi 2019b, 16–31; Moran 2018). Conscious life then is not a flow of states enclosed in themselves but is *of* or *about* something. Philosophers rooted in the phenomenological tradition argue that intentionality is an integral characteristic of all experience. It can be described within domains that are primarily mental, such as propositional thinking, memory, volition—and domains that are primarily bodily, such as perception and affectivity. Some philosophers and cognitive scientists also speak of *motor intentionality*. They refer to the fact that by physically moving our bodies, we entertain certain relationships with the world that are different than other such possible relationships.

Merleau-Ponty contributes significantly to elaboration on the notion of motor intentionality, which he also described as an original form of corporeal mobility or practical interaction with the world (2012, 100–148; 2020, 96–117). Building on earlier phenomenological works, he contrasts

motor intentionality with an “intentionality of representation” (2012, 520 n57) that corresponds to our thematic, propositional, and reflective relation to objects and serves as a basis for our explicit volitional decisions. The dualistic psycho-physical approach envisions realization of the movement of one’s body as requiring mental (or neural) representation of the action and physical movement as a third-person process taking place in the body and in the world (2012, 113). Merleau-Ponty argues that such propositional reflective awareness is neither sufficient nor necessary for execution of bodily movements.

In our pragmatic motor interaction with the world, no such representations seem to be involved. For example, in executing a goal-directed movement, we do not have explicit knowledge of precisely which body parts are involved or of the geometric coordinates and trajectory of the movements. Merleau-Ponty (2012, 2020) also points to empirical cases of agnosia and apraxia, in which one’s capacity to practically move the body and one’s capacity to represent objects and events are clearly dissociated. A patient experiencing agnosia can execute concrete practical tasks but has difficulty relating to specific perceptual content types (e.g., recognizing a doorknob). Conversely, while a patient experiencing apraxia understands what they are supposed to do (e.g., open a door), that reflective and propositional knowledge does not enable their execution of movement. More recently, Merleau-Ponty’s thoughts on the originally pragmatic and prereflective nature of motor intentionality have been corroborated in studies on double dissociation between body schema and body image in unilateral neglect and cases of deafferentation (Gallagher 2001, 153–154; 2005, 40–55).

Building on these considerations, Merleau-Ponty notes that motor intentionality does not correspond to an act of “I think that” an object has such and such properties but to processual awareness of what “I can” (or cannot) practically do within a situation (Merleau-Ponty 2012, 139; cf. Husserl 1989, 159–160). To move one’s body means “to aim at the things through it” without having an explicit awareness of it itself or of a specific object (Merleau-Ponty 2012, 140; cf. Gallagher 2001, 150–151). Our body is not merely a material vehicle but also a power to accomplish certain ranges of actions within our environments (cf. Merleau-Ponty 2012, 145–146; 1963, 168–169; in the context of physiotherapy, cf. Arntzen et al. 2019; Natvik et al. 2019; Normann 2018). We do not first experience our environment as a collection of neutral objects and only then consider what we can motorically do with them. Rather, we experience certain aspects of the world as immediately correlative to and calling for the various capacities and skills enabling us to move our body and physically interact with objects. There is then room to speak of a bodily understanding of the world, as our body’s capacity for action imbues our environment with values, we would not otherwise have access to.

Conceptually, motor intentionality contributes to our understanding of physiological events in the body as neither merely mechanical nor consciousness-dependent properties of the subject but relational phenomena that variously enable and constrain bodily subjects' interactions with their environment. It reveals shortcomings of mechanistic and functional views on bodily action. Those approaches fail to grasp bodily action processes as linked to subjects' difficulties and optimal performances, because they only consider more or less isolated internal body processes. The relational nature of motor intentionality is not a property of the consciousness, as implied by much qualitative research proponents, since the relation in question is enacted through physical movements and postures. Embodied motor intentionality involves a truly two-directional interaction between subject and environment, in which every sense-making act implies modification to its originator's embeddedness in the physical world.

Once we recognize the fundamental difference between reflective awareness of purely physical events and original bodily action, we can distinguish between different types of motor behavior that are identical from natural-scientific and representationalist perspectives. Conceptually, motor intentionality contributes to situating bodily processes in proper environmental context and thus clarifying why, in specific cases, such processes are sufficient for practical coping.

#### *4.2. Motor disorder as a loss of differentiation and variability of motor intentionality*

Building on the psycho-physical dualism critique and evidence that bodily processes are relational phenomena, we argue that motor disorders are best understood as structural modifications of bodily intentionality. Accordingly, we outline our interpretation of physiotherapy as systematic work with such modifications.

Recently, numerous researchers have argued that psychopathological conditions involve disturbances of intentionality (Krueger and Taylor-Aiken 2016; Fuchs 2007; Slaby et al. 2013; cf. de Haan 2020; Gallagher 2018; Slatman and van de Ven 2020; Zahavi and Martini 2019; Zahavi and Loidolt 2021). Some recent physiotherapy research also contributes to our understanding of structural changes of intentionality, even if it does not specifically focus on this concept (Arntzen et al. 2019; Normann 2018). This line of inquiry should be elaborated on in physiotherapy, especially regarding the specificity of bodily intentionality and motor affordances. To outline this approach, we turn to Merleau-Ponty's analyses of processes by which intentional relationships with the world are modified due to bodily pathologies.

In his search for phenomenological interpretations of neural pathologies, Merleau-Ponty suggests admitting "vulnerability" of consciousness as opposed to presuming that impairment either leaves presumably universal cognitive capacities fully intact or eliminates them completely (2012,

126). He further argues that patients with neuropathological disorders are not simply deprived of one part of their experience or behavior, such as visual recognition or motor control. Rather, illness *structurally modifies* their intentional relationships with the world and decreases the overall complexity of their experience and behavior (Merleau-Ponty 1963, 64, 68; 2020, 120–121; referring to Goldstein 2000, 115–132).

In neural disorders, illness disintegrates the bodily “system of equivalences” that allow subjects to immediately transpose different motor actions and sensory experiences across different situations (Merleau-Ponty 2012, 142, 172, 244). That is, a healthy individual experiences various possible combinations of bodily movements as equivalent concerning the effort required to establish or maintain a specific relationship with the environment (2012, 149–150). For example, under normal conditions, we can open a door from different angles, while sitting or standing, and with the left or the right hand. To a great extent, practical coping relies on our capacity for transposing dynamical relations with the environment across constantly varying sets of internal and external circumstances. Conversely, pathologies of motor behavior are linked to patients’ decreased ability to transpose and vary their movements for certain interactions with the environment.

Merleau-Ponty’s ideas on variability in bodily intentionality correspond to elements of physiotherapeutic practice. For example, in examining how well a patient’s foot grasps the ground, physiotherapists may observe how the foot stands on a solid flat surface and then use balance aids to test the adaptability of the grasp as related to the changes of angles and softness of the surface. Alternatively, the foot’s ability to vary and transpose its grasp can be tested by instructing the patient to perform a squat or to catch a ball while standing on a flat surface and then on a balance aid. A decreased ability to vary the grasp during these changing circumstances manifests as an uneven distribution of weight in different parts of the sole.

However, the dynamic nature of bodily intentionality also implies its openness to structural enhancements motivated by environmental challenges (cf. Merleau-Ponty 2012, 138). Concerning the acquisition of “motor habits” and “perceptual habits” (2012, 143–148, 153–155),<sup>ix</sup> Merleau-Ponty suggests that learning a bodily skill refers to neither the ability to execute a given sequence of physical movements on command nor to the possession of a detailed mental representation of such movements. Rather, it means refining one’s ability to transpose a skilled activity across variations within the body and environment. For example, an organist has habitualized organ playing when they can readily transpose execution of a given composition from one organ to another differently constructed (2012, 146–147). Similarly, to claim that one has truly learned to walk is possible only when one is capable of flexibly varying their movements to compensate for changes in surface, tilt of the ground, type of shoes, etc.

Bodily intentionality must therefore be conceived of as a relation to the world that allows for different degrees of organizational complexity, which depend on various processes of pathological disintegration and finer structuration in learning. A dynamic conception of intentionality invites understanding that an optimal intentional relationship to the world does not simply involve readiness to respond to a specific stimulus with a specific behavior (that is, a neural or physiological mechanism) but requires a capacity to vary responses under changing circumstances, and perhaps even develop new, more complex standards of behavior.<sup>x</sup>

Consequently, physiotherapy should address motor disorders primarily as modifications of bodily intentionality that deteriorate its standards of behavior. Objective measurements of physical structures must be interpreted in the context of patients' capacity for differentiating, varying, and transposing their movements within specific situational interactions.

The validity of the approach is well illustrated by neurological disorders. From the objectivist perspective of standardized medicine, a paretic arm must be described in terms of quantifiable measures such as range of active and passive joint movements or the spasticity level of each muscle (e.g., Prager and Lang 2012). The relationship between a given physical symptom and its value within patients' concrete experience is then determined abstractly and in advance (e.g., Masiero and Carraro 2008). Similarly, patients' ability to perform specific practical tasks is examined through standardized tests involving activities such as turning over cards or inserting sticks into holes. As the variables used in these tests must be easily quantifiable, they typically involve measures such as the time required for the action, or the number of repetitions accomplished within a specific time frame (e.g., Prager and Lang 2012). Now, we have argued that such factors do not in and of themselves determine patients' degrees of ability to cope with environmental challenges. This is evident from the fact that, in the case of a card test for example, patients' ability to vary and differentiate their movement and posture cannot be captured through the limited number of quantified variables used. One patient may turn over six cards by employing a single inflexible maneuver at a higher speed, whereas another may only be capable to turn over three cards within the same time span, yet without performing unnecessary movements by other parts of the body, expending as much energy, or requiring the deck of cards to be in the same height.

In such cases, physiotherapy should pay attention to the extent a patient with a paretic arm approaches situations through limited muscle coordination schemes rather than varying and differentiating movements or the extent intended movements are accompanied by unnecessary movements in other parts of the body. An objectively more impaired paretic arm may better serve a patient if they more effectively integrate it in pushing, leaning, and holding, compared to an objectively less impaired arm the patient experiences as a passive burden. Insofar as motor differentiation

is reduced, the patient may only be successful in, for instance, catching a ball or turning over a card from a given angle or position but not others. Such limitations lead to patients' decreased capacity to anticipate future events and maintain postural stability and to their expending more energy than should be necessary. In focusing only on aspects of the paretic arm that can be standardized, physiotherapy would be overlooking what is truly essential in the patient's condition.

Motor intentionality and degree of disintegration should also be investigated with patients' common musculoskeletal disorders such as low back pain, enthesopathies, and impingement syndromes. In many cases, individuals are capable of developing an interaction with the environment. However, over the long haul, an insufficient structural development and decreased variability of motor intentionality in such interaction can lead to physical deterioration. For example, in the case of a runner experiencing chronic pain in muscle attachments around the knee, the physiotherapist must investigate to what extent the runner employs the foot as a passive hoof rather than grasping the ground with it or to what extent the trunk is being passively carried by the leg rather than being engaged in a continuation of bouncing forward in the direction the patient is running. Beyond focusing on restoring certain bodily functions for fulfilling specific tasks, a motor intentionality-focused diagnoses would investigate the extent the runner employs adequately differentiated and variable movement patterns in response to running environments. We argue that patients' experiential and behavioral limitations stem primarily from not having adapted sufficiently to a particular physical condition of their body to structure and vary their bodily movement to pursue given interaction with the world.

In short, physiotherapy must address patients' capability to seamlessly adjust their posture and movement so as to maintain overall sensorimotor situation organization by flexibly compensating for environmental variations with internal variations. This capacity for "bodily understanding," as Merleau-Ponty calls it, makes it possible for an individual to continue to walk, for example, having transitioned from a flat and stable surface to a tilted or slippery one. As a *relation* between subject and their environment that the subject strives to maintain across variations, bodily understanding can be neither measured nor adjusted to patients' benefit within strictly universalistic frameworks. Across objective variations measured, physiotherapists must therapeutically address intentional stability as a factor pertaining to the body-environment system as a whole.

#### *4.3. Physiotherapy increases structuration of motor intentionality through bodily dialogue*

Considering that motor disorders are best understood as losses of the dynamic structuration of relations between patient and environment, we argue that motor disorders can only be optimally *adjusted* at the level of bodily intentionality. As patients' intentional relationships to the environ-

ment are always unique according to how they make use of physical means available to them, therapists cannot simply unidirectionally ascribe general functions to physical conditions (cf. Rudebeck 2001). Therapists must address the particular relatedness of patients' specific sensorimotor capacities to praxic environmental requirements. Consequently, therapists can neither manipulate patients' bodies as passive objects nor merely instruct patients to devise appropriate use of their bodies themselves. Rather, the therapist must model situations that motivate restructuring of patients' bodily intentional relatedness to their environments. Within the dynamic field of bodily interaction created by the therapist, the patient is guided to elaborate new correspondences between their intentional acts and the specific limited physical means currently at their disposal.

The fundamental part of this therapeutical process occurs strictly at the bodily level, an idea not yet sufficiently addressed in literature. As therapists' interactions with the patient involve strongly corporeal aspects, such interactions could be likened to *empathy* as described in phenomenological philosophy (Fuchs 2017; Jardine and Szanto 2017). Empathy has been recognized in the context of general medicine (Gallagher 2001, 158–161; Nortvedt 2017; Svenaeus 2014); however, relatively little attention has been paid to how empathy is related to motor aspects in this context (Normann 2018; Rudebeck, 2001; Schmidsberger and Löffler-Stastka 2018). Råsmark et al. (2014) and Kordahl and Fougner (2017) channel the phenomenologically inspired work on empathy and intercorporeality by Rudebeck (2001), in the context of physiotherapy; however, their qualitative research addresses only verbal reflection on bodily experiences, not bodily intentionality. Rather than reflective acts, empathy between physiotherapists' and patients' bodily intentionalities involves reciprocal coordination and open-ended bodily dialogue that some authors describe in the context of dance (Sheets-Johnstone 2010; Purser 2017a; 2017b) and physiotherapy (Normann 2018).

Physiotherapeutical bodily dialogue can be theorized by developing Merleau-Ponty's notion of intercorporeality (Marratto 2012, 141–163; Walsh 2019; cf. Arntzen et al. 2019; Normann 2018; Øberg et al. 2015; Purser 2017b), which has seen cognitive-scientific justification in contemporary works building on discovery of mirror neurons (Sinigaglia 2008). The idea of intercorporeality builds on the fact that one's corporeality is “communicable” or “participable,” which means that bodily subjects are originally capable of positioning their experiences in relation with others' (Merleau-Ponty 2002, 71; cf. Fuchs and De Jaegher 2009; De Jaegher and Di Paolo 2008; Lindblom and Ziemke 2008). Considering the body as a system of equivalences that allows for transpositions of sensorimotor experiences, Merleau-Ponty argues that this aspect of embodiment also assures immediate correspondence between what a person is doing and what they see others doing (2012, 370). On this view, our bodily capacity for intercorporeal transposition allows us to learn to execute never

before performed bodily actions through our perceptions of others' execution of such actions (2012, 370).

In a bodily interaction process so understood, therapists use their own bodies, environmental elements, and relevant working aids to organize learning situations tailored to patients' precise needs. For example, to open a patient's motor intentionality to more adequate variations of meaningful postures and movements, the therapist pushes the patient's shoulder blade from the direction closed off from the patient's movement while instructing the patient to act against the force. Here again, sense-making is relational; however, in this case, the principal poles of the interaction are constituted by the two bodily subjects (on intersubjective relational sense-making, see De Jaegher and Di Paolo 2007). By specifically positioning patients, pushing or pulling parts of their bodies, or presenting resistance to their movements (and using verbal instructions if necessary), therapists help patients more finely structure their bodily coordination and generate novel functional oppositions among various motor possibilities.

Therefore, apart from using language to communicate and apply theoretical knowledge of anatomy, physiology, neurology, biomechanics, and kinesiology, therapists must build on the fact of their own embodiedness and the *practical* and *bodily* knowledge they have acquired (cf. Gallagher and Payne 2014; Normann 2018). As embodied beings, therapists are open to given sensorimotor situations and understand their bodily requirements for posture and movement. Patients' limited intentional relationships with situations are thus readjusted through incorporation into therapists' richer and more adaptable relationships. Such therapy operates experimental, gradual readjustments of the intentional value of patients' physical means of interaction with the world through intersubjective bodily interaction.

## 5. Conclusion

Physiotherapy and other medical disciplines would remain limited in their ability to understand the nature of their interventions in the living body and to carry them out with optimal efficiency if they understand it as a system of mechanical processes and/or as an object of consciousness. Phenomenological analyses of the living body and theories of embodied cognition show that the body should be viewed not merely as a system of chemical and physical processes but also as a vehicle and operator of a certain relationship to the environment. Accordingly, even the events taking place inside the body must be viewed in connection with the body's relationship with the environment. These processes have a relational value—they allow for or impede the concrete realization of a certain relationship with the environment.



The living body's relationship with its environment is called bodily or motor intentionality by Merleau-Ponty and theorists of embodied cognition. Physiotherapy and other medical disciplines focusing on the living body must therefore deal with intentionality. However, the type of intentionality at issue here does not have the form of a contemplative awareness of an object but is realized by means of concrete physical movements and the adoption of bodily postures for the sake of achieving practical, vital goals.

Motor intentionality is neither a mechanical reflex nor an explicit conscious control of the body as it allows to transpose bodily acts of the same vital meaning between situations that can have completely different physical and psychological components. Motor intentionality can be more or less structurally complex. It can be more or less adaptable, variable, and internally differentiated. Correspondingly, physiotherapy cannot aim for imposing some ideal, presumably "healthy" form of physical behavior. Rather, its goal must be to enrich and structurally develop patients' motor intentionality.

Structural development of motor intentionality is best achieved through concrete bodily interaction between patients and therapists. Therapists' task is not to mechanically manipulate patients' body and/or verbally instruct their consciousness to perform isolated bodily acts. Rather, their task is to dynamically create situations that incrementally guide the patient to finding different, better bodily solutions to motor and postural problems.

In defending these theoretical views, our aim is not to argue against systematic recording of measurable deviations or to call for abandoning mechanistic theoretical framework-based interventions altogether. Rather, we suggest that these deviations be rigorously interpreted in the context of concrete human behaviors. Conversely, we do not claim that the principles presented here are completely unknown to physiotherapists and other practitioners. Physiotherapists often intervene at the level of motor intentionality, but the essence of their interventions is mostly unreflected and unintentional. Working from a conceptual framework adopted from phenomenology and enactivism, we hope that said interventions can be reflected and elaborated upon, systematized, and theoretically grounded. In this framework, the basic explanatory unit constitutes the relation between body and environment, and motor understanding of one's environment involves an activity that is sense-based or intentional but also close to prereflective.

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<sup>i</sup> Such techniques include the “Bobath concept,” also known as “neuro-developmental treatment,” named after Berta Bobath and Karel Bobath (Meadows and Lynch-Ellerington, 2009); proprioceptive neuro-muscular facilitation, also called the Kabat’s method (Knott et al. 1968); the Feldenkrais method developed through self-rehabilitation by Moshé Feldenkrais (Feldenkreis 1990); the Vojta’s method or “principle,” also known as the “reflex locomotion according to Vojta” and named after the neurologist Václav Vojta (Vojta and Peters 2007); or the Alexander technique, named after the actor F. M. Alexander (McGowan 1997).

<sup>ii</sup> For a more detailed discussion on functional approaches in physiotherapy, see Section (3.3).

<sup>iii</sup> Specifically, Husserl’s aim was to conduct a systematic analysis of the “correlation” between subjective acts of consciousness and specific types of objects. Heidegger and Merleau-Ponty later spoke more generally about human “being in the world.” For more details, see Section (4.1.) on intentionality.

<sup>iv</sup> In the domain of sports research, for example, several authors argue that a considerable proportion of such qualitative research is labeled “phenomenological” without proper justification and lacks basic understanding of the idea of phenomenology (Allen-Collinson and Evans 2019; Halák et al. 2014; Kříž 2019; Martínková and Parry 2011, 2013).

<sup>v</sup> According to Zahavi (2019a, 2019b, 125; 2020, 2021), Van Manen’s and Giorgi’s transpositions of phenomenology onto empirical research involve exegetical inaccuracies and contribute to confusion of terms rather than simplifying qualitative researchers’ task.

<sup>vi</sup> Merleau-Ponty understands the body schema as a precognitive system of bodily capacities to synergically act in the world. This concept continues to play important roles in contemporary literature on embodiment (Gallagher 1986, 2005; Ataria et al. 2021).

<sup>vii</sup> Much like in the case of the hand reversal illusion, synergic exploration may become disturbed if finger positions differ from the usual. See Merleau-Ponty’s discussion of the Aristotle’s illusion (Merleau-Ponty 2012, 211-212; Blom 2009, 37-38).

<sup>viii</sup> Here, we disregard another possible objection against this type of studies that relates to the objectivation of experiential events. As is well known, pain, for instance, is very difficult to objectivize. For a contrasting enactive approach to pain, see Stillwell and Harman (2019, 2021).

<sup>ix</sup> For interpretations, see Dreyfus (2002), Halák (2020), Howell (2015), Moya (2014), Talero (2006), Standal and Moe (2011), and Stolz (2014).

<sup>x</sup> Merleau-Ponty’s ideas could be developed with the help of enactivism, in which a living organism is studied as a metastable system that continually determines its own viability conditions by situating itself in relation to the environment (Maturana and Varela 1980; for development in connection with adaptability, see Di Paolo 2005; Di Paolo and Thompson 2014). Beyond that, Merleau-Ponty’s works converge with ideas from Canguilhem, who envisions health as “more than normal—that is, adapted to the environment and its demands” (1991, 200). For Canguilhem, much like for Merleau-Ponty, a healthy individual must be “normative, capable of following new norms of life” (Canguilhem 1991, 200; on dynamic normativity in Merleau-Ponty, see Halák and Klouda 2018).