

Natalie Depraz, Shaun Gallagher

Introduction

Natalie Depraz

Part I

**Looking forward to being surprised
- at the heart of embodiment -**

Dedication to Francisco Varela

Listenfullness Blown by the
wind of Being
I listen, listen my ears emptied,
filled by the bodies that have
loved me.

Death came looking for me.
I said:
I'm full to the brim.

F. J. Varela (unpublished
poem)

Francisco wrote these lines about one month before his liver-transplant, at a moment when he was expecting a liver at any moment without ever knowing *at which moment* he would be called by the hospital. For nearly one year he literally lived an *awaiting* as the imminent possibility of both life and death. The

radical coincidence of these extremes made of each instant a precious jewel, for he knew that each instant could also be the last one. This acute experience of death within life is highly revealing - retrospectively - of the striking continuity and intricacy of his life and of his intellectual project as a unique thread which irreducibly links time and embodiment, nourished as it is by the following question: how can I learn to live in the present moment without projecting myself into the future or comforting myself by relying on sedimented past events? In other words: how to “be there” while “being now”?

In the following I would like to indicate the multifarious variations of such a radical intuition along the different steps of Francisco’s theoretical reflection, as a testimony of this light and acute constancy he so genuinely embodied.

Integrating the novelty in oneself: the autonomy of the living being

As early as 1981 the threads of embodiment and temporality are tightly woven together in the crucial theme of the arising of novelty in the natural world (Varela, 1983). In what is to my mind an amazing first synthesis of his previous groundbreaking work *Principles of Biological Autonomy* (1979), Francisco Varela offers a renewed presentation of the autonomy of living beings. In 1979 the idea of autonomy characterizes a system endowed with a strong inner self-determination, also called self-affirmation. Such a notion is considered as a necessary condition for understanding natural systems: cells, multicellular organisms, the nervous system or the immune system. Autonomy calls for an understanding of the system by means of its inner coherence, which is another name for the Spanish expression he created with Maturana: “*clausura operational*” (“organisational closure” in English) understood as a structural coupling between the self-regulated organism and the world it interacts with. In that respect, Varela makes a clear-cut distinction between input (computational) coupling and structural (embodied) coupling. The former is behaviorist, in that respect dependent on exteriority and of a representational kind; the second one is phenomenological : it is ruled by its inner interconnectivity and brings about creativity. Novelty therefore is not linked to a mere partial perspective or to our ignorance; it proceeds directly from our ability to question a system in its behavior while interacting with it, thus radically transforming its dynamic. It opens the way for a genuine understanding of unexpectedness in nature.

Enaction and natural drift

Less than ten years later two concepts are ready to describe what seems first to be relatively left in the shadow in 1979-1981, given the strong stress put on the

autonomous identity of the living being: the radical unexpectedness, or, in other words, the contingency of life.

In the early eighties the originary coupling with the world was at the service of the coherent self-affirmation of the system; in the early nineties the process of enaction and the movement of the natural drift, in a parallel way (at the evolutionary level for the latter; at the developmental level for the former) account for the way nature (both ancestral and environmental) plays a decisive part in our organisation as living selves (Varela, Thompson, and Rosch, 1991, esp. Chs. 8-9).

In that respect enaction amounts to revisiting self-organization insofar as in embodied cognition the living being and the world are co-emerging or co-originating. Thus the autonomy of the former proceeds directly from this reciprocal process of genuine structural coupling. Enaction designates such a move of mutual emergence, with a stress put on its practical operativity and a critical stance laid against any representational or hermeneutical process.

As far as the notion of “natural drift” is concerned, it represents an interesting attempt at questioning the adaptationist notion of “fitness” while leaving the space open for the possible arising of unknown events that would affect and transform the inner dynamic of the living being. Against the notion of an optimal adaptation (an efficient coping) of the living to/with the world due to a regular process of progressive fitness the idea of natural drift describes the evolution of the living as the result of a co-determination of the self and its world where both are interwoven, that is, co-implicated.

Being present: the gift of the surprise

Now, such an inner coupling between living being and world requires a more explicit study of the intrinsic temporality of the former. In his article “The Specious Present: A Neurophenomenology of Time-Consciousness” (1999), Varela directly tackles the issue of the neural-dynamic roots of the present moment while relying on a detailed account of Husserlian time-consciousness. What is here at stake is to bring together the third-person analysis of dynamic synchronization of long-distance neuronal assemblies in the brain and the first-person account of the lived time as it is experienced by each singular subject *i* analyzed by Husserl in his structured description of the time-consciousness). The underlying hypothesis is that both analyses are not only isomorphic to each other but literally co-generate each other, that is, produce new experiences and renewed categories on both sides.

This revisited two-fold analysis of the living present leads Francisco to insist on the role of protentions in the constitution of the extended now as playing a generating part in the whole dynamics and to correlatively stress the part played

by the emotional dimension therein. These two aspects are not directly present in Husserl's analysis, even though there are indications of them. They become central in the description of the *now* as soon as they appear, supported by the neurodynamic analysis itself. Hence the crucial meaning of being present as cultivating the ability to anticipate the unexpected, and being aware of the strong emotional quality of such an "unexpectedness". Welcoming what is as radically unexpected - "a surprise" - is the challenge of this renewed understanding of time.

Self-anticipating: the rhythm of emotions

In order to account for the complex phenomenon of the surprise, it is necessary to trace back the precise move of its emergent genesis in consciousness. Such a step is taken by putting the key but much-neglected role of affect and emotions at the originary source of the living present, as a foundational dimension of the moment-to-moment emergence of consciousness (Varela and Depraz, 2000). The leading hypothesis is the following: emotions cannot be seen as mere colorations of the cognitive agent, understood as a formal and un-affected self, but are immanent and inextricable from every mental act. In other words, the question is: What is the role of affect-emotions in the self-movement of the flow, of the temporal stream of consciousness? Now, such a temporal unfolding of self-affection is from the very start traversed by alterity, that is, it includes an other, which can be the other within myself, so a kind of self-alterity that also empirically appears in the basic emotional disposition to which affective valence gives rise.

The idea of an affective emergence of the micro-temporality of the living present emphasizes the intrinsically emotional-potential component of it. At the heart of time lies the possibility of self-anticipation, which motivates a renewed understanding of the very temporality of the surprise itself. Even though we can cultivate an ability to anticipate the general structure of the coming event, we are ultimately left with the radical surprise of its particular content (Depraz and Varela, in press).

The "instant" of being embodied

The article "Radical Embodiment: Neural Dynamics and Conscious Experience" (2001), written with Evan Thompson, broadens the scope of the enquiry by focusing on the embodiment of the cognitive agent understood as "situated". Its general purpose lies in understanding the place of conscious experience of such an embodied and situated agent in the nexus of natural causality. While mapping the lived experiences of consciousness in the dynamic activity of large-scale

neural assemblies, the notion of natural causation is enriched insofar as it comprises both the generation of global activity patterns by local interactions (emergent upward causation) and the modulation of local interactions by those global activity patterns (downward causation).

The authors therefore make a preliminary distinction between three radical dimensions of embodiment, which constitute three basic cycles of a agent's life: 1) the organismic regulation of the entire body; 2) a sensory-motor coupling between organism and environment; 3) an intersubjective interaction, involving the recognition of the intentional meaning of actions and linguistic communication in humans.

The general contention is the following: being embodied is being embodied in a singular given situation (*hic et nunc*), but does not amount to a mere punctual embodiment insofar as conscious experience occurs only at the level of the *whole* embodied and situated agent. Hence the strong hypothesis according to which each individual instant of my embodiment is revealed by an integrated and coherent operation, that is, both by my whole set of abilities as well as by the transient integration of numerous, widely distributed and constantly interacting functional areas of the brain. Against the "atomistic localization bias" (either at a phenomenological level or at a dynamic level), the approach defended by Francisco could be called holistic had not he himself dismissed such a view as being outdated, that is, as a one-sided reaction to a strong reductionist program. He even goes so far as opposing holism and good science, which he claims for himself, and insist on the necessary dialectic between the global and the local level, which holism has never understood. Hence, on the contrary, the primacy given to the notion of emergence.

Embodied imagination

Such a radical view (both neuro-dynamical and genetic-phenomenological) of our embodiment finds a particularly challenging case study in the experience of imagination, which is usually (at least in our rationalist philosophical and scientific tradition) considered as belonging to the realm of illusory and unreal appearances.

The purpose of the essay "Imagining: Embodiment, phenomenology and transformation" (Varela and Depraz, 2003), is precisely to do justice to the genuine embodied nature of imagination by bringing together different domains of research and experience where our relationship to images is not relegated to an abstracted and delusional attitude. Contemporary neuroscience, the philosophical phenomenological tradition and Tibetan Buddhism form the integrated platform of such a challenge: first there is a wide consensus among neuroscientists that the ability to produce and manipulate imaginary objects stems from the very

same neural capacities as those involved in high-level vision and cognition in general, both requiring the participation of memory, language, anticipation and movement. Second, according to the phenomenological tradition imagination is a cluster of human abilities (mental imagery, remembrance, fantasy, dreaming) and thus belongs to the very core of human consciousness. In fact it is grounded on a pre-reflexive (pre-noetic, unconscious) level of consciousness from which it shines forth. In short, the emergence of images is directly triggered by our sensory-motor bodily and emotional-affective life. Third, the Buddhist view is that all instances of both imaginary and perceptual awareness are grounded in a pre-noetic level of consciousness and conditioned by our bodily interactions with the natural environment.

The braiding of these three approaches gives more strength to the two-folded contention about the embodied character of imagination on the one side, and about the continuum between neural and experiential dynamic structures on the other side. A subject is said to be radically embodied in each of his actions insofar as one is able to reveal their integrated and holistic functioning along a strong continuity of his neuro-dynamic and his genetical-phenomenological processes. Imagination is an exemplary case study for such a braided continuum.

On becoming aware: the praxis of embodiment

Imagination thus provides a first pioneering view for what is more broadly at stake in *On Becoming Aware: An Experiential Pragmatics* (Depraz, Varela, and Vermersch, 2003). Briefly put, we wish in this book to understand how we come to examine what we live through, that is, that most peculiar of human acts: becoming aware of our own mental life. Now the range of experience of which we can become aware is vast. It includes not only all the ordinary dimensions of human life, (perception, motion, memory, imagination, speech, everyday social interactions), as well as cognitive events that can be precisely defined as tasks in laboratory experiments, (for example, a protocol for visual attention), but also manifestations of mental life more fraught with meaning, (dreaming, intense emotions, social tensions, altered states of consciousness). Among all these acts of consciousness which remain in a condition of immanence, there lives, unperceived, a form of pre-reflexivity on the basis of which consciousness is able to perceive its very self at work.

Hence our central assertion in *On Becoming Aware* is that this immanent ability or capacity is habitually ignored or at best practiced unsystematically, that is to say, blindly, and that exploring human experience amounts to developing and cultivating this basic ability. What type of “reflexivity” is proper for exploring without disembodiment this unreflected level of our life, traversed as it is by habitual

patterns and sedimented experiences? In other words, how do we gain access to this pre-reflective and pre-given zone of our subjectivity in making it conscious? Other than what is merely on the fringe of consciousness, are there other levels of pre-noetic experience that become available when rigorously explored?

The idea is not to try to set forth *a priori* a new theory of experience as the neo-Kantians might have done, but instead to describe an activity, a concrete *praxis*. The work investigates conscious activity in so far as it perceives itself unfolding in an operative and immanent mode, at once habitual and pre-reflective.

Hence the following as a strong contention: the validation of experience through its *praxis* corresponds to the deepest meaning of embodiment, precisely because it amounts to putting it into practice. In a sense auto-poiesis and enaction had already such a meaning, they only focused however on the relationship between the body and the surrounding world and not at the level of conscious experience as such. Moreover they did not stress the instant-to-instant emergence of living being in its gradual becoming aware, thus underlining each instant of its embodiment as being a unique one.

Now, this acute sense of being radically embodied in the *hic et nunc* situation, and in it only, is particularly well experienced in the moment-to-moment arising of thoughts as thematized in some insightful contemplative practices of Buddhism. As time went by Francisco was more and more attentive to the quality of these pure instants or intervals between thoughts, which account for the density of nowness as it is given to us in its own empty quality. In a Treatise called *The Natural Freedom of the Mind*, which Francisco considered as a masterpiece of accurate analysis of the inner space of the mind as a space of self-liberation, Longchenpa describes such an immediate process thanks to which the mind appears in its pure and dense instantaneity. The inner knowledge - that is the cultivated *praxis* — Francisco had of this quality of a pure instant is undoubtedly at work in the genuine meaning he was able to provide to the experience of embodiment in both his scientific and philosophical work.

Shaun Gallagher

Part II

Phenomenological and Cognitive Sciences

The papers that are gathered in this volume aim to extend many of the themes That concerned Varela. Although not in agreement on every detail of analysis, they present a unified consensus about the importance of phenomenological

analyses of bodily experience for an understanding of cognition. They span a set of insights that run from general philosophical principles, to specific issues about proprioceptive contributions to the motor system, and back again from the dynamical processes that condition movement to issues that concern intersubjectivity and social cognition. They integrate disciplines that include neuroscience, developmental psychology, robotics, and semiotics, as well as the phenomenology and philosophy of mind.

Robert Hanna and Evan Thompson, in their paper, “The Mind-Body Problem,” identify three mind-body problems: the traditional one; the “Body Problem;” and the “Mind-Body-Body Problem.” The traditional problem asks how to account for the existence of the mental—specifically, consciousness - in a physical world. The *Body Problem* is that no account, materialist or dualist, can be adequately formulated because a true theory of the nature of the physical world is not available. The Mind-Body-Body Problem asks how we should understand the relation between subjective consciousness, the living and lived body, that is, one’s animate body with its “inner life” and “point of view;” and the objective body which is studied from the theoretical and experimental perspective of the natural sciences. The question is how a person can be a conscious subject, a living body, and an objective material thing all at the same time.

Hanna and Thompson propose an “animalist” solution to this problem. On the basis of empirical data from cognitive ethology, and first-person data from the phenomenology of human embodiment, they argue that the lived body is metaphysically and conceptually basic. That is, one’s consciousness and one’s objective body, respectively, are nothing but *dual aspects* of one’s lived body. The latter is equated with one’s being as an *animal*. This view, which contrasts with Donald Davidson’s anomalous monism and David Chalmers’s naturalistic dualism, maintains that a conscious individual creature is identical with its lived body or the animal that it is. Accordingly, the primary datum for scientific study is neither a subjective conscious mind, nor an objective material body. It is rather an animal with complementary mental properties and physical properties.

The emphasis on the lived body is naturally reminiscent of Merleau-Ponty’s phenomenology of the body. **Jose Bermudez**, in “The phenomenology of bodily perception,” examines two different strands in Merleau-Ponty’s analysis. He argues that one of these strands is profoundly insightful, while the other lacks plausibility - or at least it stands in the way of a fruitful interaction between phenomenological and experimental approaches to cognition. The first, insightful idea is that there is a discontinuity between the experienced spatiality of the physical world and the experienced spatiality of the lived body. The second and less plausible idea is that the body is not an object, and cannot be understood as an object like other objects that are encountered in the world. Merleau-Ponty distinguishes between body-relative action, taking place within a body-relative

or intrinsic spatial framework, and action that is perceived in an objective framework. He maintains that one is irreducible to the other. Bermudez understands this to be problematic if indeed we want to develop a science of bodily experience. Science, as he puts it, “whether cognitive science, empirical psychology or neurophysiology, can only inform us about the objective body. It can have nothing to say about the phenomenal body.” Bermudez sets out to address this problem, to retain some of Merleau-Ponty’s non-Cartesian insights, but to do so in a way that allows a scientific approach.

Bermudez focuses on the notion of somatic proprioception and shows how the proprioceptive spatial frame of reference is not equivalent to the egocentric (or body-centered) spatial framework that defines perceptual experience. Still, the intrinsic, body-relative spatial frame of reference in proprioception is quite consistent with what science tells us of motor control. Specifically, proprioceptive, intrinsic content needs to be integrated with the egocentric framework within which we perceive the objects with which we interact. This problem is addressed in various ways in the analysis of motor control and in the transformations or translations between intentional specifications of action in kinematic terms and the intrinsic dynamical specifications of muscle forces and joint angles. The solution to this problem is open to a scientific investigation that takes the body as an object of investigation. Clearly the lived body that is phenomenologically describable in terms of somatic proprioceptive experience, is the same body that science investigates in objective terms.

Shaun Gallagher develops an argument based on the difference between the proprioceptive frame of reference and the object-perceptual frame of reference discussed by Bermudez. In his essay “Bodily self-awareness and object perception,” he defends a position that is closer to the one that Bermudez finds troublesome in Merleau-Ponty - the idea that the body is not an object. On the one hand, he cites evidence that fully agrees with Bermudez’s analysis of the difference between proprioception and external perception in regard to spatial frames of reference. In fact, this helps to define the difference between proprioceptive awareness and, for example, tactile perception. On the other hand, if one adopts the notion of object perception defended by Bermudez (1998), specifically one that requires what he calls the ‘identification constraint’, then clearly proprioceptive awareness is not awareness of the body as an object. A phenomenological account of bodily experience shows, for example, that we do not ordinarily need to pick out our own body from other entities in the environment, nor do we normally have to keep track of our body in order to engage in action. Gallagher thus argues, in contrast to Bermudez, that proprioceptive awareness does not meet the identification constraint, and is not a form of object perception.

The fact that proprioception is a form of awareness that does not take the body as an object explains why proprioceptive awareness is immune to error through misidentification. Gallagher shows why it is necessary to retain the Wittgensteinian distinction between *as subject* and *as object* in this context. In this regard, proprioception is a form of non-perceptual, first-person experience that provides a sense of ownership for the body and its movements. What is delivered in proprioceptive experience is the ipseity of the primitive first-person experience of embodiment that is a basic part of the self - non-self distinction.

Maxine Sheets-Johnstone, in her essay on “Kinesthetic memory,” elucidates its centrality to everyday human movement. She employs Luria’s seminal notion of a kinetic melody and related phenomenological analyses of movement. According to Sheets-Johnstone, movement creates a distinctive kinetic dynamics in virtue of its spatio-temporal-energetic qualities. Merleau-Ponty’s notion of “motor intentionality” and body image, however, are inadequate to the phenomenology of animate being insofar as they fail to take this dynamical aspect of bodily movement into account. Luria, in contrast, emphasizes that movement is a process with a temporal course formed of interconnected phases combined into integral kinaesthetic structures or kinetic melodies. The temporal organization of movement involves a constant regulation of muscle tone through a set of rapid and smooth transformations from one system of motor innervations to another.

To explain movement in terms of static body schemas is to ignore the most important dynamical aspects of movement, the kinetic melodies that are inscribed in our bodies and that constitute the basic repertoire of kinetic capabilities or the “I cans” (Husserl) of animate life: “walking, speaking, reaching, hugging, throwing, carrying, opening, closing, brushing, running, wiping, leaping, pulling, pushing.” Kinetic dynamics cannot be translated into a postural attitude oriented to possible tasks. Merleau-Ponty’s notion of a body image fails to capture the dynamic promise of the body, something which is kinesthetically felt, experienced in the flow of movement itself. The notion of body schema (Gallagher and Cole, 1995) offers little improvement. According to Sheets-Johnstone, it has no basis in experience, and is at best an explanatory convenience, a hypothetical brain mechanism invented to explain movement in a series of static frames. In contrast to such traditional (and metaphysical) pointillist views, movement cannot be reduced to a sequence of non-moving parts. Its essence is to be dynamic.

Monica Meijsing questions the priority given to the dis-embodied brain in philosophy of mind, and asks if we are not something more than our brains. In her essay, “Phantoms and movements,” she argues that reducing the human person to a brain would be possible only if the experiencing subject were a completely passive being. She calls this the *argument from movement*!. A brain on its own could not have sensations and intentions; such things depend upon embodied movement and action. Only as essentially active, self-moving bodies can we be

active agents, and our brains are more the *result* of this fact, than its presupposition. In this respect, according to Meijnsing, it is not enough to talk about proprioception, which is a passive result; one must focus on self-movement in order to understand the nature of the experiencing subject. Yet this idea is difficult to defend in light of the phenomenon of phantom sensations, and especially in regard to phantoms that exist in patients with congenital absence of limbs (aplastic phantoms). It would seem that no body part is necessary in order to generate a phantom, and that actual movement is unnecessary for us to experience sensations and intentions. Meijnsing suggests that this qualifies the argument from movement only because the phantom parts are unreal. Brain processes are sufficient only when there are unreal phantoms to control. Real limbs cannot function, however, without the help of external or peripheral feedback from real movement.

Meijnsing examines both thought experiments and real empirical cases that challenge the argument from movement. In some of the empirical cases, it seems, the sense of ownership of one's body does not depend on proprioceptive or kinesthetic feedback from actual movement, but is generated centrally, that is, in brain processes. In the case of post-amputation phantoms, however, one can argue that the *content* of the basic intention or the sense of ownership, can only have originated in real movement in the past. The difficult cases involve aplastic phantoms. Aplastic phantoms seem not to depend on prior movement of a limb but may be explained by topological neural representations of the body in the brain, or by innate body schemas. Yet, as Meijnsing points out, based on developmental evidence, real movement is not equivalent to phantom movement, and cannot be reduced to brain processes alone. When real limbs are involved, controlled movement does not come automatically via innate representations. Infants have to learn to control their movements, and to do so they require real limbs and real feedback. The brain alone, certainly a necessary requirement for this, is nevertheless unable to accomplish this alone. The very limited evidence concerning aplastic phantoms is not sufficient to defeat the argument from movement, although it does introduce important limitations on that argument.

Frederique de Vignemont, in her paper, "Ghost buster: The reality of one's own body," argues for the importance of innate body schemas, identified by Meijnsing as possible causes of aplastic phantoms. Not only the existence of phantom limbs in aplastic patients, but studies on neonates as well provide evidence of an innate component of body representation. With this in mind, and complementary to Meijnsing's concerns, de Vignemont asks about the epistemic bases of the knowledge of the reality of our own body. Experience, in the form of proprioception also plays an essential role here. It produces a body representation and more particularly contributes information for motor control at the level of body schema. The absence of proprioceptive information induces

illusions of phantom limbs through the remapping of the Penfield Homonculus, illusions that contradictory visual feedback cannot erase. Yet, in some degree, vision does intervene in body knowledge, de Vignemont notes that vision of the body allows deafferented patients to move and phantom limbs to disappear.

In normal bodily action, when we are engaged in everyday projects, the body operates in a transparent way; the body is phenomenologically “absent” (Leder, 1990; Gallagher, 1986). That is, we are not specifically aware of the movement of our legs as we walk across the room; we are not specifically aware of how we shape our grasp as we reach for something. In pathological cases, however, modifications of this absence or different kinds of absence can be experienced. In the phenomenon of phantom limbs, for example, the body part is literally absent, but not so in its representation - indeed, as a phantom it can appear more present than other real parts. In contrast, in the phenomenon of deafferentation, the body is still literally present, although its proprioceptive representation is literally (and not just phenomenologically) absent, de Vignemont examines the implications of these various absences and presences in observational and non-observational instances of bodily knowledge. She also inquires into the importance of the vision of other people’s bodies, and points to the close connections that exist in brain activation between our own actions and the observation of other people’s action. In fact, following Brugger et al. (2000), de Vignemont suggests that this phenomenon may also play a part in the explanation of aplasic phantoms: the representation of someone else moving could motivate the representation of oneself moving. As she points out, however, this can only be a partial explanation, since it already presupposes a pre-established (and innate) representation of the subject’s own body.

The importance of both innate body representations (body schemas) and social interaction for a full phenomenological account of bodily experience is also explored by **Beata Stawarska** in her essay on “Facial embodiment in ‘invisible’ imitation.” Embodiment, she contends, is central to any theory of personhood and to interpersonal communication. Moreover these issues of self and others are interconnected in a way that blurs any clear-cut distinction between the inside and the outside. As she puts it, “If self and other are made of the same corporeal stuff and are similar despite differences, they can engage with one another directly, through manifest behavior, without the need to translate some hidden invisible subjectivity into the visible mundane world. Communication begins already on the surface of the expressive face, in the tonality of the voice, in the affective charge of the gaze.”

The evidence for this can be found in studies of neonate imitation. The nonverbal corporeal exchange involved in neonate imitation has a communicative character insofar as the two parties both respond and are responded to by the other. This embodied, but pre-ideational, and, as Stawarska argues, non-

representational process is already an *interpersonal* process not simply because there is a *de facto* mimicking of gestures that others perform, but because the infants use others as visual models to guide their own gestural movements. More than this, however, the response by the other is equally important: being seen by others provides the possibility of an indirect experience of one's visible facial exterior in a third-person mode. In effect, building on a Sartrean phenomenological analysis of the other's gaze, Stawarska suggests that facial imitation is not a solitary, intra-personal process of matching motor representations, but an *interpersonal* process where seeing the other's face and being seen by the other dynamically interrelate.

Natalie Depraz explores this dynamic dialectic of intra-personal and interpersonal relations in her detailed phenomenological account of the experience of being pregnant, in "The intimate other." She argues that the immanent self-lucidity of the body pre-figures and anticipates what reflexive consciousness grasps only later and in a more rational way. Normally, in everyday activities, our body operates along a graded scale of bodily consciousness, moving from focused attention to a relative lack of attention, with different degrees of bodily mindfulness in between. For the most part, the less we bother with our body, the better it functions: our bodily activity is lived-through in a consciousness that Merleau-Ponty calls (following Husserl) "operative intentionality," and that Leder (1990), describes as "bodily efficiency," a positive "self-effacement" of the body.

In specific ways, the experience of pregnancy both reveals this self-lucidity and changes it. It is often the case that we experience negative bodily sensations, as in fatigue, back pain, or illness as a disruption of the self-lucidity of the body. Our body suddenly becomes present. The lived experience of pregnancy also motivates a self-manifestation of the body, but not one that is exclusively negative, since it corresponds to the life of another that is growing within our own body. The other, as within and as part of my body, insistently calls my attention to my bodily existence, but not simply in a way in which I make an object of my body. Rather the self-manifestation involves a sensory, emotional, and imaginative self-alteration. Indeed, what develops is a deeply emotional intimacy that has the character of a radical relational immediacy between mother and child. This can turn out to be far stronger than any spontaneous intimacy the mother is able to feel towards herself. Depraz describes this not as an alienation, but as a return to the self, through the other.

Natika Newton, in her "Representation in theories of embodied cognition," examines a central issue in accounts of embodied experience: the role played by mental representations. Theories of embodied cognition can be either representational or nonrepresentational. Newton argues that such theories need an account of conscious mental representation if they are to explain the full repertoire of human behavior. In an ongoing debate about the usefulness of the

notion of representation in cognitive science, various theorists maintain that the concept of representation is either vacuous or misapplied in explanations of embodied cognition. Others reserve a place for representations but often fail to explain their nature. It is difficult to understand what representation means in the context of embodied cognition, if the concept is understood in the same sense as in computational theory. In the latter case, representations are conceived as relatively long-lasting neural structures that represent the sensory stimuli that caused them. In other contexts, the term representation can refer to motor programs or schemas whose “meaning” is fixed innately or in early development.

Newton proposes a distinction between *neural patterns*, traces of sensory activation which are not in themselves representations but are available for representational activity, and *the act of representing*, which is what bestows representational content on neural patterns. Newton objects to viewing representations as fixed neural structures with established content. Rather she proposes a model in which content arises only during actual cognitive activity. Representations arise when we actively interact with the environment. Their content is provided by the context and goal of the activity; it is not ready-made in the neural patterns recruited for the activity. The basis for this model of representation in action can be found in thinkers like Aristotle, Peirce, and Polanyi. To say that an action is representational means that the goal of the action is implicit in its performance. This is an idea that can also be found in Merleau-Ponty. A representation is not an independent component of a behavioral sequence; instead, the action as a whole has imminent meaning in the unification of its means and end. In this sense, representation is a dynamic activity rather than a static external relation between two entities.

Helena De Preester takes up the distinction between such external relations and what Merleau-Ponty defines as an intrinsic relation, specifically the relation of consciousness and the living organism and its behavior, in her essay “Meaning: What’s the matter?” This intrinsic relation is a biological rather than either a mechanistic or a vitalistic one. To explicate the meaning of the notion of intrinsic relation De Preester traces a certain tension in Merleau-Ponty’s thought from the notion of the *descriptive* norms of the organism, to the vital need for maintaining a sensory-motor equilibrium which reflects objective and intrinsic vital interests of the organism. For Merleau-Ponty, we perceive meaning in the actions of an organism, not because we simply read them into such actions, but because meaning is intrinsic to the structure of the relation between organism and environment. Structure is the way in which matter has a sense for us - that is, for a consciousness of the material world, which already includes the living body of the observer.

Merleau-Ponty’s concept of structure is part of his attempt to move beyond dualism, idealism, and representationalism in their traditional senses. According to such traditions, meanings (sense, norms) do not belong to the world, but to

the order of consciousness. Correspondingly, an organism's behaviour is no more than a series of events in the world or in nature, without intrinsic meaning. This leads to the portrayal of cognitive processing as producing a picture of the world in consciousness, inside the organism - a representation that has to correspond with something in the external world in order to guarantee meaning. In this framework we encounter the following problem: meaning, as the content of representations, has to correspond with the external world, but since the organism has no access to that external world except via its representations, it has no basis for establishing the truth of its representations. Although Merleau-Ponty wants to propose a notion of meaning that is intrinsic to structure as a solution to this problem, it is not clear what he means by the notion of structural equilibrium. As a way to address this inadequacy, De Preester turns to the notion of autopoiesis developed by Varela, Boden, and others. This concept can resolve some of the problems found in Merleau-Ponty's account of meaning. Meaning is a biological phenomenon insofar as organisms behave in a way that is meaningful in relation to the maintenance of the autonomous metabolism of their own lives.

Like De Preester, and prefiguring the final essay by Per Aage Brant, **Ejgil Jespersen** is concerned with the relation between the body and meaning. One of the principles of intrinsic meaning involves a learning process, something that can be seen in every aspect of human and animal life. In his essay, "Bodyscapes of the act of learning," he returns to that world which, according to Merleau-Ponty, "precedes knowledge, [a world] of which knowledge always *speaks*, and in relation to which every scientific schematization is an abstract and derivative sign-language, as is geography in relations to the countryside in which we have learnt beforehand what a forest, a prairie or a river is" (1962, p. ix). This is the realm of bodily intentionality operating below the level of conscious intentionality, where learning means the acquisition of skills and antepredicative knowledge. To clarify this notion of bodily intentionality, Jespersen distinguishes between three human domains: the domain of primordial memories; the domain of movement and social practices; and the objective world of perceptions, cognitions and the like.

Primordial memory concerns habit. Bergson distinguished between *habit* memory and *image* memory, and suggested that with habit memory we can remember the past without reproducing it in any identifiable representational system. Starting here Merleau-Ponty associated habit memory with the kind of non-representational action the body takes up as a motor significance. A good example of this is learning to dance, which simply does not involve an intellectual understanding of movement. Nor does this kind of activity involve the acquisition of automatic movements - it requires the capacity for spontaneous action in a context that is socially infonned and transforming. It constitutes an "intentional arc," which relates body and world in the kind of structure that De Preester attempts to explicate.

To move and to learn are not static or “theoretical” events, but dynamical processes that structure action and social pragmatics. Jespersen suggests that structure, at this level, might be described in terms of stylistic variations that are inseparable from our physical experience of ourselves. Although the notion of somatotyping is rightly in disrepute, Jespersen suggests, following Lyons (1987), that the idea is suggestive for ways of thinking of such stylistic variations. Specifically a highly cognitive (ecto) style of learning can be contrasted with both an action oriented (meso) style, and expressive or gestural (endo) style. This classification leads Jespersen to a new characterization of apprenticeship learning where there are no sharp divisions between acquisition and application of skills and knowledge. On this view, learning is anchored in corporeal beings that move and maintain what Sheets-Johnstone in her essay called “kinesthetic memory.”

The final paper of this collection, “From Gesture to Theatricality” by **Per Aage Brandt**, takes us further into what Jespersen called the expressive, gestural (endo) structure of embodied comportment. In this structure the human motor system is tuned into its physical surroundings by the morphological predisposition of its basic muscular design. Brandt points out that this corporeal design is reiterated in higher cognitive functions so that schemas of our imaginative mind reflect motor patterns that have been reinforced through interaction with the spatial world. Importantly, with respect to action and interaction with others, gestural behavior can be spontaneous or consciously imitated, controlled, or even faked. We can find here the roots of what we call authenticity and sincerity on the one side, and simulation, manipulation, and dishonesty, on the other. In contrast to honest gestures, simulated or theatrical gestures are shown or enacted. In this way the analysis of embodied meaning can move into the realm of significant behavior.

Theatrical gesture - significant gesturing, role-playing, simulating, pretending, etc. - depends upon and derives from the autonomously specified meanings established intersubjectively at the level of embodiment, as representations shared by self and other. To fully comprehend such behavior one needs to refer back to those aspects of embodied comportment described in the previous essays - the properly ordered workings of the lived body, kinesthetic memory (Sheets- Johnstone), intrinsic structure (De Preester), stylistic variations (Jespersen), the dialectic of intra- and inter-subjective processes in dynamic activity (Stawarska, Newton), and the possibility of transforming self-lucidity (Depraz). These structures are, according to Brandt, open to semantic analysis since they involve meanings that bridge domains from embodied action to cognitive acts, from consciousness to linguistic communication and intersubjective interaction.

The collection of papers presented here are, thus, in general agreement about the importance of embodiment and animated life for a full understanding of cognition. While they do not agree in all details of analysis, they all refer us back to phenomenological basics - basic insights often to be found in the work

of phenomenologists like Husserl, Merleau-Ponty, and Sartre, and developed here in a high degree of detail. Collectively they represent an amazingly comprehensive response to a challenge posed by Gerald Edelman: “it is not enough to say that the mind is embodied; one must say how” (Edelman, 1992, p. 11).

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