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Embodied Knowledge – Embodied Memory

Abstract: The distinction between representational and embodied knowledge (knowing-that versus knowing-how) has gained new significance through the investigation of implicit memory. This kind of memory is formed in the course of the interaction of organism and environment: Recurring patterns of interaction are sedimented in the form of sensorimotor, but also affect-motor schemes. We may speak of an implicit “body memory” that underlies our habits and skills, connecting body and environment through cycles of perception and action. This embodied knowledge is actualized by suitable situations or by overarching volitional acts, without necessarily being made explicit.

The paper analyses the structure of embodied knowledge by taking the example of learning social skills through dyadic interactions in early childhood. It argues that the non-representational, enactive knowledge acquired in these interactions is the basis of intercorporeality and empathy. Explicit or propositional forms of knowing others (“theory of mind”) are derived from later steps of development; they are not sufficient for explaining the interactive and empathic human capacities. This will finally be illustrated by the example of autism.

1 Introduction

Gilbert Ryle’s seminal contraposition of two fundamental forms of knowledge, *knowing that* and *knowing how* (Ryle 1949), may be traced back to Aristotle’s distinction in the ‘Nicomachean Ethics’ between *epistêmê* and *technê*, the first meaning theoretic or scientific knowledge, the latter skill or craft. Bertrand Russell (1910) has proposed the terms “*knowledge by acquaintance*” and “*knowledge by description*”, pointing out that the former is obtained through a direct interaction with objects or situations, whereas the latter is acquired in an indirect way, namely based on propositional language, for example, through description or explanation.

There has been a long and still ongoing debate on whether these two types of knowledge belong to distinct categories, or whether one depends upon the other, and if so, which is the more basic one.¹ However, if it is true that in our

¹ Ryle himself as well as Dreyfus (1972) argue that *knowing how* as a realization of skills, i.e. complex dispositions, may not be translated into propositional statements, whereas Stanley (2011) takes the opposite intellectualist position: “Knowing how to do something is the same as knowing a fact” (l.c., vii).

intuitive dealings with situations we always “know more than we can tell” (Polanyi 1967), and if we thus could never fully describe how to dance a Tango or to recognize the “mischievous” expression in someone’s face, then this implicit knowing may in principle not be completely converted into declarative or symbol-based knowledge.

With regard to developmental psychology too, it quickly becomes clear that our everyday relation to the world is based on a fundamental familiarity and skilfulness which is already acquired in early infancy before the development of symbolically and verbally mediated knowledge. At the end of their first year of life, babies are capable of highly differentiated interactions with persons and objects which doubtlessly fulfil the criteria of knowledge by acquaintance, long before conceptual knowledge of others is acquired. Here too, *knowing how* precedes *knowing that* (on this, see below).

Nevertheless, concepts of knowledge that may be described as propositional, symbol-based or representational are clearly prevalent in present-day cognitive and social sciences. Whether the question is how we recognize the world in general or how we perceive the social other, the way the question is posed already assumes a distant observer who learns about the world not through practical interaction, engagement and participation but through detached description, modelling or reconstruction. To acquire knowledge then means to form an idea, a representation or a model of the object or of the other, on which basis one can then proceed to action. Accordingly the mind is conceived as a system of inner models, constructs or representations which today are localized in the brain and enable the prediction of changes in the external world. In this way, however, the knower and the known, or cognition and the world remain separated from each other on principle.

Two related approaches are currently challenging this cognitivist paradigm, namely the *embodied and enactive approach to cognition* on the one hand and the *phenomenology of the lived body* on the other. Both seek to overcome the dualism of representational mind and external world by regarding conscious experience as a person’s being in the world through the medium of the body. According to the enactive paradigm, perception and action are inherently connected (Varela et al. 1990, Thompson 2007): Feeling a surface is accomplished through the *act of touching*, seeing an object is enabled through the *activity of looking*, etc. Moreover, each perception already evokes possibilities for action, that means, the objects are accessible for us, “ready-to-hand”, in Heidegger’s terminology, offering affordances for our mobile body (Gibson 1979). In these perception-action cycles, however, inside and outside, or mind and world can no longer be separated.

In the same way, phenomenology regards consciousness not as a self-enclosed entity, but as “being-towards-the-world” through the medium of the body (Merleau-Ponty 1962), or in other words, as the intentional and practical relation of the embodied subject to the objects and situations it finds itself in. Embodiment is the primordial form of subjectivity, but it is at the same time spatiality, situatedness, directedness to a horizon of possibilities which offer themselves to the body. On this assumption, however, the basic presupposition of representationalism has to be dropped. For representations ‘stand for something’ of which they must be separated. Now if the world is constituted for us only in the ongoing interaction with it, and if we are always already bodily acting in the world, then there is no separate “inner” which could map, reconstruct or re-present the “outer”. In a constant circular process, no segment can stand “for another”. This does not exclude representations *within* conscious experience – for example, memories, imaginations, ideas of absent objects – but defies the monadic conception of consciousness itself as an internal representation or modelling of the world.

This has consequences for the question which kind of knowledge is more basic – knowing-that or knowing-how. If the objects are primarily given or ready-to-hand through our embodied interactions with them, and if the world is thus always already disclosed through the medium of the body, then representational knowledge appears only later on the scene. It is called for in the very moment when the ongoing, pre-reflective interaction with the world or with others is disturbed or interrupted. To use Heidegger’s example, when a hammer breaks, it loses its usefulness and appears as merely *there*, “present-at-hand”, and becomes a problem to be solved. Similarly, when the primary, empathic, interbodily communication with others suffers an irritation or disturbance, then we become aware of them as “beings of their own” which are not really transparent for us. In such situations of rupture we start reflecting or theorizing about the objects or the others, asking for explanations, causes, mechanisms, or in other words, seeking *knowledge about* them instead of relying on *knowledge by acquaintance*. This irritation and the attempt to overcome the resulting worry may be regarded as the root of *epistêmê* or science in general.

The distinction between knowing-that and knowing-how has gained additional momentum through the investigation of *implicit memory*. This kind of memory is formed in the course of the interaction of organism and environment: Recurring patterns of interaction have sedimented in the form of sensorimotor schemas and corresponding bodily dispositions. We may speak of an implicit “body memory” that underlies our everyday habits and skills, without necessarily being made explicit (Fuchs 2000, 2012). This embodied knowledge is realized in suitable situations through habitual action or through overarching volitional

acts. It then connects body and environment through ongoing cycles of perception and action that are based on earlier experiences.

In what follows, I will first present the concept of embodied knowledge, then connect it with the notion of body memory in order to elaborate its developmental dimension. I will then further elucidate the structure of embodied knowledge by taking the example of acquiring *social skills* through dyadic interactions in early childhood. I will argue that the non-representational, enactive knowledge acquired in these interactions is the basis of intercorporeality and empathy. Explicit or propositional forms of knowledge about others (“theory of mind”) are derived from later steps of development which presuppose the capacity of perspective-taking. They are not sufficient, however, for explaining the basic empathic human capacities, or the knowing-how of intercorporeality.

2 Embodied knowledge

Now what is embodied knowledge? – According to Ryle, *knowing that* is information-based knowledge that can be asked for and communicated in propositional language. In contrast, *knowing how* refers to training-based knowledge (e.g., how to ride a bicycle, how to dance a waltz) that cannot be reduced to a set of propositions. It consists of dispositions for integrative perceptions and actions which are enacted by the body without targeted attention. Granted, there is no strict separation between both knowledge systems. Knowing that and knowing how together may contribute to intelligent behaviour, as can be seen in the case of an experienced surgeon (Ryle, 1949, p. 49). Propositional knowledge then provides higher-level strategies which in turn are realized through practical, embodied know-how. Thus, in skilful coping, top-down and bottom-up approaches work together and influence each other reciprocally.

The traditional cognitivist approach, however, has no concept of knowing how; instead, it conceives of the mind as a disembodied system of representations and predictive models that are separated from embodied action. The standard information-processing model has a “sense-think-act” structure (Pfeifer & Scheier 1999; Pfeifer & Bongard 2007): First, the mind is supposed to *represent* the situation on the basis of stimuli processing (“sense”), then it computes the suitable behaviour (“think”), and finally it issues the corresponding command for bodily motion (“act”). Thus, there are three clearly divided stages of cognition and action: input, inner computational process, and output.

This model disrupts the unity of mind and body interacting with the environment in ongoing feedback cycles. In embodied action, there is neither place nor time for a separate goal representation which could then produce the necessary

movement. Instead, bodily skills and environmental affordances work together in a moment-to-moment process of continuous adjustment and fine-tuning. There is no hidden mind that directs the body based on deliberations or calculations. In his *Phenomenology of Perception* (1945/2012), Merleau-Ponty describes the example of knowing how to typewrite as follows:

[O]ne can know how to type without knowing how to indicate where on the keyboard the letters that compose the words are located. Knowing how to type, then, is not the same as knowing the location of each letter on the keyboard, nor even having acquired a conditioned reflex for each letter that is triggered upon seeing it. [...] It is a question of a *knowledge in our hands*, which is only given through a bodily effort and cannot be translated by an objective designation. The subject knows where the letters are on the keyboard just as we know where one of our limbs is – a *knowledge of familiarity* that does not provide us with a position in objective space. (Merleau-Ponty, 1945/2012, p. 145, emphasis added)

This knowledge is not representational, but it is not subpersonal either, that means, only to be found in neurally realized cognitive systems. It is enacted by the lived or subjective body, the body that I am myself as the agent of typing. “Consciousness is originally not an ‘I think that’, but rather an ‘I can’” (p. 139), as Merleau-Ponty writes. “I can” does not mean the conscious control of bodily motions, but rather a prereflective, protentional awareness of possible movements that accompanies each action. It is spread over the body, as it were, on the basis of the sensorimotor body schema. Through its habits and skills, the body anticipates or rather *implies* potential actions: It is prone to act in a way that is influenced both by its acquired dispositions and by the affordances or possibilities of the present situation. The more skilled and habitualized the body’s action, the less we are conscious of it, as William James has put it: “Consciousness deserts all processes where it can no longer be of use.” (James 1950, p. 496) In short, the body is the subject which knows how to act.

3 Implicit and explicit knowledge

Embodied knowledge may also be conceived, in Polanyi’s terms, as *tacit* or *implicit knowledge* (Polanyi 1967) in that it cannot be explained or verbalized explicitly. When our body parts coordinate while dancing a tango, when we perceive the expression of anger in someone’s face, or when an experienced psychiatrist intuitively makes a diagnosis on the basis of various symptoms and his overall impression of the patient, there is each time more knowledge involved than we can tell. A major reason for this is that the forms of knowing how are based on intermodal and sensorimotor *gestalt units*, that means, they inte-

grate different sense modalities and bodily movements into a holistic experience, as becomes obvious in tango dancing – think of the typical swing and rhythm of a movement and its musical grounding. In contrast, verbal articulation may only explicate single strands out of this undetermined-manifold clew of holistic experience. Thus, it is able to class these strands into a general context and to render them available to communication – yet at the price of losing the immediacy and unity of intuitive experience.

Our primary experience consists of holistic impressions, encompassing gestalts of perception and movement, whereas the single elements are only explicated secondarily: “It is the explication of the implicit which first generates delimitable components of meaning, namely through creating precision, selective emphasis and semantic relations.” (Jung 2014, p. 76; my translation). Only poetic language is able to evoke holistic impressions. It achieves this through rhythmicity and prosody, multivalent usage of words and last not least through the self-referential frame of the artwork: A poem does not refer denotatively to a pre-given reality as does ordinary speech. Of course, the impression thus evoked is again an experience that may not be fully transformed into propositional language.

The explicating analysis of implicit experiences into single elements generally runs the risk of losing the primary phenomenon. Examples for this abound: A perceived facial expression is lost if one pays attention to its single features or details. Similarly, if we focus on a body part, it often no longer functions as a component of implicit capacities. A musician who pays attention to his individual fingers during a passage will easily make a mistake, and a tango dancer will look ridiculous once he moves his legs deliberately like a beginner. Practitioners in many skilled movement domains are aware that self-conscious thought can disrupt well-practised actions.

Interestingly, a *pathological loss* of embodied knowledge may be found in schizophrenic patients who often experience a fragmentation of holistic perception into single details:

I have to put things together in my head. If I look at my watch I see the watch, watchstrap, face, hands, and so on, then I have got to put them together to get it into one piece. (Chapman 1966)

A schizophrenic patient of Minkowski’s was no longer able to read because ‘[...] he became attached to a word, a letter, and did not attend to the meaning of the sentence. He examined whether all the “I”s had dots over them, whether there were accents where needed, whether all the letters had the same form.’ (Minkowski & Targowla 2001, p. 273)

Similarly, the units of habitual action sequences may dissolve, resulting in a pathological explication and hyperreflexive awareness of normally tacit aspects of everyday behaviour:

If I want to do something like going for a drink of water, I've to go over each detail – find cup, walk over, turn tap, fill cup, turn tap off, drink it. (Chapman 1966, p. 239).

At times, I could do nothing without thinking about it. I could not perform any movement without having to think how I would do it. (de Haan & Fuchs 2010)

These pathological cases illustrate again that the implicit structure of embodied knowledge conveys a holistic mode of existence which cannot be replaced by explicit reconstruction. The body acts as the medium of our relation to the world precisely inasmuch as it withdraws into the background of awareness. It conceals itself precisely in the act of revealing the world (Leder 1992). Turning our attention backwards on our embodied skills and habits tends to dissolve the spatial and temporal gestalt units on which they are based.

4 Body memory

Implicit knowledge or knowing how is not just an innate property of the body, but develops and constantly changes over the whole life-span. The acquisition of skills and habits has come to be explored in cognitive psychology under the heading of “*implicit*” or “*procedural memory*” (Schacter 1987, 1999), for which I will use the more encompassing phenomenological notion of *body memory* (Fuchs 2008, 2012).

Body memory may be defined as the entirety of established practices and skills that are available through the medium of the lived body without the need to remember earlier situations. Habits formed through repetition and practice are activated of their own accord; well-rehearsed sequences of movements have been incorporated, thus becoming a bodily capacity – like the upright gait, speaking or writing, using instruments like a bicycle, a typewriter or a piano. This bodily memory, which was first considered by Maine de Biran (1799/1953) and Henri Bergson (1896/2007), does not re-present or “presentify” the past, but rather re-enacts it in the ongoing conduct of life. In the last analysis, all capacities during one’s life point to a primordial capacity of the embodied subject, to a basic “I can” (Husserl, 1952, 253).

There are two major ways of acquiring bodily habits and skills: On the one hand, we can *explicitly synthesize* single elements of perception and movement through deliberate training. What is perceived or performed piece by piece at

first is gradually integrated and incorporated as a novel skill. Thus, we have learnt at primary school to spell and connect single letters until we could read the whole words and sentences. We have learnt to dance a tango by combining the single movements until the body had integrated them into an overarching flow of rhythm, dynamics and movement. Granted, these learning processes are based on pre-existing gestalt units (the word as heard, the swing of bodily movement, etc.) in which the explicit elements may be integrated.

On the other hand, many skills and habits are acquired *implicitly or unnoticed*, namely as a “learning by doing”, just through repeated practice, be it in dealing with objects or through interacting with others. Indeed, the most fundamental skills which have disclosed the world for us and upon which our everyday practices are based have sedimented into our body memory in the first and second year of life without any explicit teaching. This applies in particular to a type of memory to which we owe the skill of bodily interacting with others, and which I call *intercorporeal memory* (Fuchs 2012). In what follows, I will look at some stages of its development.

5 Intercorporeal memory

Infant research has shown that newborns are already able to imitate facial expressions of others like frowning, opening of the mouth, protruding the tongue, etc. (Meltzoff & Moore 1977, 1989), later on also emotional expressions such as smiling or surprise. This shows that they are equipped with an innate body schema which enables them to translate the seen gestures into their own felt movement, thus gaining a basic sense of familiarity with others. As early as in the first months, infants are also capable of discerning emotions such as happiness, sadness, and surprise in the postures, movements, facial expressions and vocal intonations of others (Hobson 2005, pp. 39). The basis for this is that different sense modalities and movements can have the same ‘kinematics’ and thus express the same affect, which may best be rendered in *musical* qualities (‘crescendo’, ‘decrescendo’, flowing, bursting, pulsing, etc.). The feeling of joy and the various expressions of joy have similar intermodal dynamics, and this is the basis for the direct perception of others’ emotional states even in earliest childhood.

Affectivity, however, is primarily not an inner or individual state, but a dyadic experience of mother and infant, mediated through expression and bodily resonance in subtle gestural, facial and vocal interactions. Already 6–8 weeks after birth, so-called “proto-conversations” arise, that means, alternating vocalizations and gestures (Trevarthen 1979), overall a fine-tuned co-ordination of movements and expressive signals which may be compared to a couple dance. These phenom-

ena of “interbodily resonance” (Fuchs u. De Jaegher 2009) and “affect attunement” (Stern 1985) generate encompassing emotional states: The emerging affect during a joyful playing situation between mother and infant may not be divided and distributed among them, but arises from the shared social situation. Emotions are primarily embedded in intercorporeality and interaffectivity.

Moreover, recurrent patterns of interaction and affect attunement are sedimented as interactive schemas in the infant’s body memory (“*schemes of being-with*”, Stern 1985), for example “mummy-feeding-me”, “daddy-playing-with-me”, etc. This results in what Stern (1998) has called *implicit relational knowing* – an embodied, intuitive knowledge of how to interact with others, how to have fun together, how to elicit attention, to avoid rejection etc. It is a temporally organised, “musical” memory for the rhythm, dynamics and undertones which resonate in the interaction with others. Thus, long before verbal communication infants already acquire a primary understanding of others through shared practices recorded in their intercorporeal memory.

6 Embodied empathy and its disturbance in autism

This is the basis of a primary form of empathy that emerges in face-to-face encounters: In embodied interaction, the other is not assumed ‘behind’ his action, but he enacts and expresses his feelings and intentions in his conduct. Embodied relational knowledge conveys an intuitive awareness of the other’s affective state. In perceiving his expressive movements and actions as embedded in the shared context, “[...] one already sees their meaning. No inference to a hidden set of mental states is necessary.” (Gallagher & Zahavi 2008, 185) Moreover, in social interaction, one’s own body is affected by the other in various forms of bodily resonance, sensations, tensions, movement tendencies etc. This resonance forms part of the embodied knowledge that allows us to understand the other’s state.

In contrast to this account, the currently predominant theories of social cognition are mainly based on representationalist approaches: Concepts such as Theory of Mind, mentalization or mindreading (Antonietti 2006, Goldman 2012) assume a fundamental inaccessibility of the other whose hidden mental states, intentions or feelings may only be inferred from his external bodily behaviour by using some sort of rule-based ‘mindreading’. Social cognition would thus be based on observation, inference and *knowing that*, even though it may not always be expressed in propositional terms.

However, our primary and everyday encounters with others are not observations from a 3rd person point of view, but embodied interactions within the 2nd-person perspective. In these, we normally don't use any imaginative modelling or inference; instead, we immediately perceive the other's intentions and emotions in his expressive behaviour. Of course, we may sometimes apply methods of explicit conjecturing or inferring another's mental state. This happens in particular when an irritation, misunderstanding or disturbance occurs, and we ask ourselves why the other said or did what he did, what he might be thinking or feeling, etc. We can then also transpose ourselves into the other, take his perspective, reason about his motives, search for his hidden intentions etc. As I argued at the beginning, *knowing that* is called for when the ongoing, pre-reflective interaction with the world or with others is disturbed. But it is not the primary or default mode of social understanding, and it is only acquired much later on in childhood. Rather, implicit intercorporeal or relational knowing forms the basis of intersubjectivity. This may finally be illustrated by another psychopathological example, namely *autism*.

As is well known, children with autism lack the basic emotional contact with others, which leads to a variety of social, communicative and cognitive deficits. According to current cognitive theories of autism, the disorder is due to a difficulty to "read other people's minds," or to imagine what they are thinking or feeling. The suggestion is that autistic people lack a "Theory of Mind" (ToM) – the purported neural or cognitive device that computes others' underlying intentions from their perceived behaviours. In recent years, however, criticism has been raised by phenomenological psychiatrists and philosophers, arguing that the deficit is rather caused by failures of early interaction and intercorporeality (Hobson 1993, Gallagher 2004, Fuchs 2015). This is supported by the fact that many autistic symptoms such as lack of emotional contact, of interest in others, agitation and anxiety are already present in the first years of life, that means, long before the supposed age to acquire a ToM which is around 4 years.

I have pointed out before that knowing how is essentially based on processes of gestalt formation that enable us to perceive and act in a holistic way instead of being aware of the single elements. This applies for social cognition as well: The expression of a face is only perceived when we do not focus on a single feature or detail. Now it has been demonstrated that autistic children show problems precisely in establishing *perceptual and situational coherence*: They focus on single parts or elements rather than perceiving the gestalt of objects, and they tend to treat things and events decontextualized, thus missing their particular meaning provided by the situation as a whole (Frith 1989, Happé 1995).

Accordingly, eye tracking studies have shown that children with autism focus on peripheral features of faces, and on irrelevant details of interactive sit-

uations while missing the relevant social cues (Klin et al. 2003). This failure of holistic cognition may have some positive effects such as remembering unrelated or non-sensical items, however, it significantly interferes with the development of social understanding. Thus, as I have pointed out above, affect attunement is crucially based on perceiving emotional cues (gestures, facial movements, voicings) as holistic expressions and as embedded in recurrent situations. Similarly, understanding the intentions of others depends on learning how to relate their gestures and actions to the context in order to grasp their meaning.

Such deficits of autistic children converge to a fundamental disturbance of embodied social perception and interaction very early in life. They are not able to acquire the implicit relational knowledge that is based on schemes of being-with-others taken up into one's intercorporeal memory. What autistic children lack is thus not a theoretical concept of other minds but a primary sense of bodily being-with-others. ToM-like strategies of explicit mentalizing and inferring from social cues are rather employed by high-functioning autistic individuals as a *compensation* for the lacking capacities of primary intercorporeality. Thus, Temple Grandin, a woman with Asperger's syndrome, described her problems with interpersonal relations to Oliver Sacks as follows:

It has to do, she has inferred, with an implicit knowledge of social conventions and codes, of cultural presuppositions of every sort. This implicit knowledge, which every normal person accumulates and generates throughout life on the basis of experience and encounters with others, Temple seems to be largely devoid of. Lacking it, she has instead to 'compute' others' intentions and states of mind, to try to make algorithmic, explicit, what for the rest of us is second nature. (Sacks 1995, p. 270)

These compensatory strategies enable functional interactions with others to a certain degree, but fail to establish the primary sense of being-with-others which is normally conveyed by intercorporeality and implicit relational knowledge:

She is now aware of the existence of these social signals. She can infer them, she says, but she herself cannot perceive them, cannot participate in this magical communication directly [...]. Knowing this intellectually, she does her best to compensate, bringing immense intellectual effort and computational power to bear on matters that others understand with unthinking ease. This is why she often feels excluded, an alien. (Sacks 1995, p. 272)

As we can see from Grandin's report, the implicit relational knowledge mediated by the body and its intercorporeal memory cannot be substituted by explicit inference or rule-based theorizing; in other words, knowledge by acquaintance *with others* may not be replaced by knowledge *about them*.

7 Summary

Embodied knowledge is the foundation of our familiarity with the world and with other people. It is a knowledge and skill which is realized in perceiving and reacting on situations, without needing targeted attention or memory. The subject of knowing is itself embodied: It finds these knowings and skills not inside, but only in its practical engagement with the world. In contrast, representational, symbol-based forms of knowledge – knowing that – arise from an indirect, secondary relation to the world which the human mind is capable of by taking a distance from objects and situation and representing them as such. This presupposes, however, that the world is already disclosed to us via the medium of the body which has acquainted itself with the world from birth on. We experience the world, because our body has become *transparent* for it; that means, we experience the implicit actions and affections of our body *as* the objects and situations of our environment.

Following Polanyi (1967, 1969) we may describe this transparent structure of our experience as an interplay between the “distal” pole, i.e. the thematic, explicit or focal object of awareness, and the “proximal” or bodily pole, which recedes from attention and is known only in a tacit, non-thematic manner:

Our body is the only assembly of things known almost exclusively by relying on our awareness of them for attending to something else [...] Every time we make sense of the world, we rely on our tacit knowledge of impacts made by the world on our body and the complex responses of our body on these impacts. (Polanyi 1969, p. 147)

The body is thus “passed over in silence”, as Sartre (1956) put it. Inasmuch as we perceive or act through an organ of our body, “it necessarily recedes from the perceptual field it discloses” (Leder 1990, p. 14), and the same applies to the skills that are realized by the organs. Thus as a medium, the body withdraws in the tacit dimension; “it conceals itself precisely in the act of revealing what is Other” (Leder 1990, p. 22), and yet remains the core of our self. The transparency of the body arises precisely from the embodied nature of the mind.

Therefore in the application of embodied knowledge or skills we are not dealing with a blind or even subpersonal occurrence which we could only ascribe to a (neuro-)physiological process. The skills that are based on body memory, such as tango dancing, are realized by tuning in to the familiar rhythm of movement and enacting its particular style. It is I myself who is dancing, not a body machine commanded by a disembodied mind. This allows me to conduct and modulate the body’s enactments, like a conductor its orchestra, without having to generate them, for they happen of their own accord.

As we can see, embodied knowledge unburdens our attention from an abundance of details, thus facilitating our everyday performances. The body and the senses become a medium through which the world is accessible and available. We are capable of directing our attention toward the gestalt and the meaning of what we encounter. Action is facilitated, as we may intend its goal instead of noticing every single movement. The will becomes free since the bodily means and components of acting recede into the background. A primary goal-directed intention suffices to release the complete arc of action. While his fingers move the keys, the pianist is able to direct himself to the music itself, to listen to his own play. Thus, freedom and art are essentially based on the tacit knowing how of the body.

The body's familiarity with the world is not innate, however, but is based on a primary disclosure of the world which, using a stoic notion, may be termed *oikeiosis* (from the Greek *oikos* = house, home), that means, "indwelling" or becoming acquainted with one's home. *Oikeiosis* develops in early childhood in the course of embodied interactions with the world and with others, as described above. In these, infants feel perceived and accepted by their caregivers and, embedded in this affective resonance, they can acquire the skills of dealing with objects and situations. The disclosure of the world happens primarily through *knowledge by acquaintance* in shared, intercorporeal practices. Thus, familiarity with the world and with others are equiprimordial and inseparable foundations of the lifeworld. As soon as representational or symbolic forms of cognition and knowledge develop, they permit an extended understanding of the world and open up new possibilities for action. However, they remain always dependent on the primordial familiarity with the world which the body had already established before we became aware of it.

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