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PHENOMENOLOGY AND COGNITIVE SCIENCE OF EMBODIED INTERSUBJECTIVITY

In philosophy of mind and cognitive science, intersubjectivity or social cognition – the question of how we experience and understand others – has been explained, beginning with the 1980's, with the concept of *theory of mind*. Theory of mind refers to our ability to attribute mental states (intentions, beliefs, desires) to others, and to explain and predict their behavior in terms of these mental states. The main problem of social cognition, within this framework, is this: how do we get to represent, based on their publicly observable, external bodily behavior, other people's unobservable inner mental states? How can we "read" the hidden minds of others? Contrary to "theory of mind"-approaches, classical and contemporary phenomenology of intersubjectivity claims that we can directly perceive and understand the meaning of the mental states, intentions and emotions of others, because they are not hidden, but explicitly expressed in their embodied actions and expressive behaviors. Theories of theory of mind have been also challenged in recent years by an increasing number of empirical findings about the embodied nature of social cognition (e.g. mirror neurons in cognitive neuroscience, infant imitation in developmental psychology, etc.). Based on such empirical evidences, proponents of *embodied intersubjectivity* are now arguing that social cognition is grounded in and shaped by the perception, expression and understanding of embodied actions, emotions and intentions.

The aim of my paper is to demonstrate that the phenomenology of intersubjectivity can complement and inform – both at the descriptive and at the theoretical-conceptual level – the ongoing work in the field of *embodied social cognition* in a more productive way than "theory of mind"-approaches in analytical philosophy of mind. I thereby follow those recent proposals, which are arguing that phenomenology can contribute significantly to current empirical research in cognitive science and the scientific study of consciousness, and are trying to establish a mutual

exchange between phenomenology, cognitive science and analytical philosophy of mind. Phenomenology is understood here not just as the textual corpus of one of the dominant philosophical movements of the last century, but also as a philosophical methodology for discovering the invariant structures of various types of experience as experienced in the subjective or first-person point of view, and then intersubjectively corroborated. The methodological assumption of the research is that the biobehavioral processes discovered in the cognitive sciences can also be experienced and described from the phenomenological perspective of first-person experience. Therefore the first-person or second-person data obtained from phenomenological or developmental accounts, and the third-person data about neural processes and behavior could reciprocally enlighten and constrain each other.¹

The paper is structured as follows: in the first part I present the phenomenological account of embodied experience and the new paradigm of embodied cognitive science, with the intention to highlight their points of convergences and their common theoretical and methodological assumptions; in the second part I first outline the phenomenological critique of theories of theory of mind and then I demonstrate the relevance of the phenomenology of intersubjectivity for the interpretation of current empirical findings about the embodied nature of social cognition (mirror neurons and infant imitation).

1. The body: embodied experience in phenomenology and cognitive science

I distinguish here between three meanings of the body: 1. the physical-biological body; 2. the subjective phenomenal experience of the lived body, and 3. the historically-socially-culturally constructed body. I don't intend to deny the relevance of the third meaning, but in the present context I am mainly interested in the constitutive role of the second, i.e. the subjective phenomenal experience of the lived body. It is quite obvious that there has been, from the 1980s, a certain boom of body and embodiment studies in sociology, anthropology and other social and cultural studies (B. Turner, M. Featherstone, C. Schilling)², with important predecessors like Foucault (with his history of the effects of power or discursive formations on the body, i.e. the discipline or the government of the body), Bourdieu (with his concept of *habitus*, which refers to the

body as invested with symbolic capital, the body as an expression of the hierarchies of social power), or the feminist theories about the social construction of gender roles and sexual identities. But there is a persistent problem, from the phenomenological point of view, with all this social and cultural studies of the body: the conception of the body as a historically, socially, culturally constructed representation, discourse or text neglects the constitutive dimension of the experience of the lived body.³

1.1. The lived body

If we turn now to the phenomenological meaning of the body, or more precisely, to the phenomenal experience and the phenomenological description of the lived body, we should start with a basic phenomenological distinction between two different ways we can experience and understand the body: the *objective body* and the *lived (animated or living) body*.⁴ (This corresponds to Husserl's original distinction between *Körper* and *Leib*, reiterated in French phenomenology, by – among others – Merleau-Ponty, as the difference between, on the one hand, “le corps objectif” and on the other hand “le corps propre”, “le corps vécu” or “la chair”). The lived body (*Leib*) refers to the body experienced from the subjective, first-person perspective of the embodied subject, whereas the objective body (*Körper*) can have two different, but interrelated senses: 1. the body as a material thing perceived from an observer's third-person perspective (for example the biological, i.e. neurological, physiological or anatomical body). 2. the objectification of my own body in bodily self-exploration, which allows to experience it – to a certain degree – as an objective body, as from the outside, for example when my left hand touches my right, or when I perceive another part of my body.

Following mainly Husserl's phenomenological descriptions, I'll present in what follows three different dimensions of the subjective phenomenal experience of the body, which are also playing a central role in the husserlian phenomenology of embodied intersubjective experience: 1. the lived body as the “null centre” of orientation, 2. the kinaesthetical, actively perceiving, and 3. the sensing body.⁵

1. The body as the “*null centre*” of orientation. My body is the “null centre” or the “zero point” of my orientation toward the world, the absolute “here” in relation to which every other object is situated “there”, i.e. “near” or “far”, “within or beyond reach”, “in front” or “behind”, “to the

left or to the right” etc.⁶ For example, on this table before me, the perceived monitor of the laptop is “in front” of me, the perceived coffee cup is “to the right” of me etc. – that is, I am the center, the absolute indexical “here” in relation to with every perceived object is oriented. This absolute “here” of orientation is not a position or a point in the objective geometrical space, but a center in relation to which a pre-objective, bodily or sensorimotor (that is: constituted in active perception, see below), an “egocentric” space unfolds. Whereas I can approach or move away from any object in the world, the body itself is always present as my very perspective on the world, I can never move out of my own central “hereness”. Rather than being another perspectively given object, the body itself is the perceptual origin, the embodiment of the first-person, subjective perspective which allows me to perceive objects perspectively and to interact with them. I do not have a consciousness *of* my body as an intentional object, I don’t perceive it, but *I am it*.

2. The *kinaesthetical, actively perceiving* body. The lived body is not just the “null centre” of orientation, but also a moving or potentially moving body. If I reach for the coffee mug, I know where to reach not just because I have a sense of where it is in relation to myself, but also because I sense that I will be able to reach it, or that I will have to take two steps towards it. My perception of the coffee mug must involve *kinaesthetic awareness* (our awareness of lived bodily movements and positions) of my bodily situation, otherwise I would not be able to reach for it or use it. This kinaesthetic awareness of the body is not a type of object-consciousness, but a form of pre-reflective bodily self-awareness, in which my body is experienced as a potentiality of mobility and volition, as an “I do” and “I can”.

In his lectures about the experience of space and spatial objects from 1907,⁷ Husserl calls attention to the importance of bodily movements (the kinaesthetic experiences of movements of the eye or of the head, of manipulations by the hand, of the locomotion of the body etc.) for the constitution of space and spatial objects. Perception is constantly correlated to *kinaesthesia*⁸ or kinaesthetic experiencing, that is, to the self-sensation of the moving body. Every visual or tactile appearance is given in correlation to a kinaesthesia, a sensation of a particular movement of our body: when I touch the coffee mug, it is given in conjunction with a sensation of finger movements; when I watch a moving car, the moving car is given in conjunction with the kinaesthetic sensations of eye and/or head movement.

But there is more: Husserl also describes a motivational correlation, an intentional “if-then” connection between the motivating kinaesthetic systems of possible movements and the motivated sequences of perceptual appearances: if I move in a particular way, if kinaesthesia K1 changes in K2, then the perceptual appearance A1 also changes into A2.⁹ In order to illustrate how this intentional “if-then” connection works, I will take here the problem of perceptual presence in object-perception.

When I perceive an object, say a coffee mug, the object is never given intuitively in its totality but always incompletely, in a certain restricted profile. Despite this, perception always gives us a full object-consciousness, a sense of the perceptual presence of the whole object: it seems to us at once as if we only see part of the coffee mug and as if the three-dimensional, voluminous, material thing, the whole coffee-mug is also somehow perceptually present. If this perceptual sense of seeing without seeing, of the presence in absence (of the intuitively not given profiles of the object) is obviously not the result of a judgment or of an inference, then how is it possible? Husserl’s preliminary answer is that every perception of an object has a *horizontal* structure: whenever a present profile of an object is actually given, we are simultaneously horizontally aware of the co-existing absent, but potentially present, perceptually accessible profiles of the object. But this perceptual horizon of the co-intended profiles is ultimately connected to a kinaesthetic horizon. If I am looking at the coffee mug, whereas the present profile is correlated with my particular bodily position, the horizon of the co-intended but momentarily absent profiles of the coffee mug (its back or bottom, etc.) are correlated with my kinaesthetic horizon, i.e. with my capacity for possible movement. The absent profiles are linked to an intentional kinaesthetic “if-then” connection: *if* I move in this or that way, *then* this or that profile of the coffee mug will become visually or tactually accessible.

Perception and kinaesthetic experience (the actual and possible sense of movement) are thus intrinsically intertwined: perception presupposes movement, it is intrinsically active, it is a form of action.¹⁰ In regard to the perceived objects or the perceptual world, this implies that the objective, experience-independent world of the natural attitude becomes a world brought forth, enacted by the active perception of the lived body, a world not of objective things (of *what* things are), but of potentialities for bodily actions and interactions (of *how* they are perceived in active perception).

3. The *sensing body*. The lived body is also a locus of felt sensations: in exploring the tactile qualities of anything within reach, I also

experience my own body through special sensations, the feelings of contact, pressure, weight, warmth or cold, tension, etc. are localized in my body. Husserl points out that one and the same sensation can be apprehended in two different ways: when I touch the hot surface of the coffee mug, the sensation of the hotness can be apprehended either as a sensuous property of the touched object (in this case we're experiencing *sensations – Empfindungen*) or as a localized sensation of hotness in the touching hand (these are *sensings – Empfindnisse*).¹¹ But tactual experience reveals not just the lived body of sensings, but also the tactually appearing exteriority of the body, as in the case of one hand touching the other. The touching hand (the perceiving organ) has a series of sensations of the touched hand (the perceived organ); in the same time this touched hand is not given as a mere object, since it also feels the touch itself as a localized sensing. The difference between the tactile experience of objects and the tactile bodily self-exploration is that in the latter case we are dealing with a *double-sensation*, a kind of reversibility of the sensings in the two hands: the touching hand is also touched, and the touched is also touching. This reversibility reveals that the tactually given interiority (the touching) and the tactually given exteriority (the touched), the lived and the objectified body are different manifestations of the same body.¹² This self-objectivation or self-constitution of the body, his two-sidedness as lived and objective body has a crucial importance for the husserlian description of intersubjective experience, as we will see later. In the tactile (or visual) self-constitution I am experiencing myself in a manner that anticipates both the way in which another person would experience me and the way in which I would experience him or her.

1.2. Embodied cognitive science

Cognitive science is the interdisciplinary study of mind, cognition and intelligence, embracing psychology, artificial intelligence, neuroscience, evolutionary biology, linguistics, philosophy, and anthropology.¹³ Cognitivism (from the mid-1950s to the mid 1980s), encompassing both the classical *computationalist* and the *connectionist* research programs (the first based on the metaphor of the mind as a computer, the second on the metaphor of the mind as a neural network), was based on the following assumptions:

1. The mind is disembodied, atemporal and separated from the world.

2. Cognition is a central module, sharply distinct from the peripheral sensorimotor processes (perception and action), processing internal representations (symbols or neural processes) that are mirroring an external, mind-independent, objective world.

Starting with the mid-1980s and in the 1990s a new paradigm emerged, that of the *embodied* or *enactive mind*¹⁴, proposing several new ideas:

1. Cognition is the exercise of skillful know-how (not of theoretical know-what) in real-time embodied interaction with the world.

2. Cognitive structures are shaped by this sensorimotor interaction with the world, and also by emotions.

Thus, in the last two decades, the view of mind and cognition as something that cut across the divide between brain, body and environment, as essentially embodied and *embedded* (*situated* or *extended*) in the natural and socio-cultural environment, has become increasingly dominant in several fields: in philosophy¹⁵, psychology¹⁶, cognitive neuroscience¹⁷, artificial intelligence¹⁸, cognitive linguistics¹⁹ and cognitive anthropology²⁰.

Two other ideas, reminding – and sometimes influenced by – previous conceptions of the continental phenomenology, are shared only by the proponents of the so-called enactive cognitive science²¹ (Francisco Varela, Evan Thompson, and others):

3. The world is not an external objective realm, represented internally by the brain, but a relational domain enacted or brought forth by sensorimotor activity;

4. It is the phenomenological lived body (Leib) that shapes cognition, and therefore embodied experience needs to be investigated with the method of the phenomenological description of first-person, subjective experience.

In order to briefly illustrate what embodied cognition means, I'll focus here on the trend of which is sometimes called *radical* or *full embodiment*. This trend claims that the body is crucially involved not just in actual sensorimotor interaction with the world, but in all forms of human cognition, including such abstract activities, as language, thinking or mathematical cognition. To put it in another way, the thesis of radical embodiment would be that the mind (or the body-mind continuum) is literally embodied action – we are in a sense also thinking through our moving bodies. The cognitive linguistics of the embodied mind²² holds for example that our “higher-level” cognitive processes, like conceptualization and reasoning, are grounded in our pre-linguistic embodied experience, that is, our bodily orientations and movements, manipulation of objects

and perceptual interactions as we act in the world. Embodied sensorimotor experience is schematized in *image schemas*, which are pre-conceptual, recurring, crossmodal – at once visual, kinaesthetic, tactile, auditory etc. – patterns, that emerge throughout sensorimotor interaction with the environment (e. g. containers, paths, contact, balance, centrality). Our more abstract concepts are developed via metaphorical projections of these basic sensorimotor structures and our abstract reasoning involves inferences that are basically structure-preserving projections of sensorimotor inferences.

A conceptual metaphor is a conceptual mapping, through sensorimotor schemas, of entities and structure from the source domain (concrete concepts) to the target domain (abstract concepts).²³ For instance, the “source-path-goal” schema, which develops as we learn to track moving objects throughout our visual field and as we move our bodies in the world (reaching for objects or moving our entire bodies from one location to another), can be metaphorically projected onto more abstract domains of understanding and reasoning. Thereby it gives rise to conceptual metaphors such as “Purposes are destinations”, which preserve the main structural characteristics of the source domain (i.e. source-path-goal); it serves for example as the source domain for the pervasive conceptual metaphor “Life is a journey”. Another schema, the “balance” schema is something that is learned emerges through our experiences of bodily equilibrium/disequilibrium and maintaining our bodily systems and functions in states of equilibrium and also through our perception of balance. The “balance” image schema is metaphorically elaborated in a large number of abstract domains of experience (e.g. psychological states, legal relationships, and formal systems): we talk of balanced personalities, balanced views, balanced systems, balanced equilibrium, the balance of power, the balance of justice, and so on.

There are several common methodological and theoretical assumptions (and also historical connections, influences) between the phenomenological tradition and the embodied cognitive science, but for the present purpose I point out only the most important point of convergence: both in phenomenology and in embodied cognitive science meaning is experienced and constituted in embodied, pre-linguistic and pre-cultural perception and action, which also means that embodied experience precedes and constitutes the cultural-social-historical experiences of meaning.

In the second part of the paper I try to demonstrate how this common assumption can be productively applied in the phenomenological interpretation of embodied social cognition.

2. Embodied intersubjectivity

In this part of my paper I first outline a phenomenological critique of theories of other minds and then I'll try to demonstrate the relevance of the phenomenology of intersubjectivity for the interpretation of current empirical findings about the embodied nature of social cognition (mirror neurons and infant imitation). My method is that of a mutual illumination and correction between, on the one hand, the phenomenology of intersubjectivity, and on the other hand cognitive neuroscience and developmental science. Mutuality means here that even phenomenology can be challenged to correct previous descriptions, as it will be case with the interpretation of infant imitation.

2.1. A phenomenological critique of theories of theory of mind

There are two main approaches in the analytical philosophy of mind for explaining what they consider to be the basis of social cognition, that is, the capacity to have a theory of (other) mind(s). According to the first approach, *theory-theory* (TT), we use an innate or acquired theory of how people behave and of the unobservable mental states which cause their behavior (folk psychology), in order to infer ("mindread" or mentalize) the mental states of others.²⁴ According to the second approach, *simulation-theory* (ST), we don't need a folk psychological theory, because we are able to use our own mind as an inner model with which we simulate another person's mind, creating pretend off-line mental and emotional states and projecting oneself imaginatively into his or her situation.²⁵

Despite the differences and the ongoing debates between them, both of these accounts are committed, from a phenomenological point of view, to several problematic presuppositions²⁶:

1. First, there is an obvious *mind-body dualism* here: an epistemic gap separates the essentially inner, private and externally unobservable mind and the neither expressive nor significant outwardly observable bodily behavior (a kind of bare physical movement), intentional or expressive

behavior arising from a purely contingent and causal connection between these two spheres.

2. Therefore, secondly, in the absence of a direct experiential access to others social experience is a two-step process: first we perceive (present) other's external bodily behavior, and then we ascribe mental entities to them, relying on *linguistic-conceptual representations* (theoretical inferences or imaginative simulations).

3. Finally, all this process is performed from a *third-person perspective* (on his or her behavior or mind), with the intention to explain and predict other's behavior.

In opposition to theories of theory of mind, the phenomenological tradition argues that social cognition is constituted by an essentially direct an embodied intersubjective experience, a direct, non-mentalizing and non-inferential perceptual access to others. Phenomenology denies the dualist conception of an inner mind and an outer body, and reveals the strong continuity and intricacy of mind and body: mind and body are not just related by a contingent causal connection, but they are given in an expressive relation or unity constituted in embodied action and expressive behavior (both in us and in others). Therefore, as the contemporary phenomenological proposal of *direct perception*²⁷ – drawing on arguments from classical phenomenology – holds, we don't have to represent the mental states and emotions of others, because they are explicitly embodied in intentional actions, gestures and expressions, and as such, we can directly perceive and understand their meaning in a non-conceptual and non-linguistic presentation, without any further representational step of ascribing mental states.

It seems then that the correct understanding of the nature of social cognition requires the correct understanding of the relation between mind and body, that is, a conception of the mind which overcomes the dualism and the mentalism of theories of theory of mind. Phenomenology insists that in describing the experience of others, we begin from the recognition that the body of others presents itself as radically different from a neither expressive nor significant outwardly observable bodily behavior. Phenomenologists describe an embodied intersubjectivity, stressing the fundamental role of the inter-bodily experience in understanding others. In order to illustrate this, I resume in the following Husserl's account about embodied intersubjective experience.

2.2. Embodied intersubjectivity

In the *Fifth Cartesian Meditation* of Husserl the constitutive moment of intersubjective experience is precisely the empathetical experience of the other as another lived body, i.e. as another null centre of orientation, and as another kinaesthetical, sensing and feeling body. A specific intersubjective phenomenological reduction is at work here: after suspending all forms of objective, already constituted intersubjective formations (linguistic-cultural-historical social realities), we can reveal that they are all grounded in and shaped by the constitutional dimension of embodied intersubjectivity, the pre-linguistic and pre-cultural inter-bodily experience of others. The central problem of the *Fifth Cartesian Meditation* is that of explaining how an objective body could come to be perceived as another lived body, i.e. as another null centre of orientation and another kinaesthetical and sensing body. Husserl's preliminary answer is this: "Since, in this Nature and this world, my live body is the only body that is or can be constituted originally as a lived body (a functioning organ), the objective body over there, which is nevertheless apprehended as a lived body, must have derived this sense by an apperceptive transfer from my lived body [...] only a similarity connecting [...] that objective body over there with my objective body can serve as the motivational basis for the '*analogizing*' apprehension of that body as another lived body."²⁸

What is the intentional structure of this analogizing apprehension based on the similarity between two objective bodies? Husserl terms this intentionality an *appresentation*. On the one hand, appresenting the other means that the other is given to me in a presentation, not in a re-presentation (as if we would experience a sign or a memory of the other). In a general sense, every object-perception implies appresentation: being horizontally aware of the absent profiles of an object through the presentation of the actually given profile means to co-intend them in an appresentation. Appresentation amounts to intending as co-present, motivated by an original presentation, something which is not present in itself (not given in an original presentation). But on the other hand, if in the case of the object-perception the appresented profile can be fulfilled intuitively by a subsequent presentation, in the case of the appresentation of others this presentation or intuitive fulfillment is a priori excluded, that is, the first-person, subjective embodied experience itself which belongs to them (*their own* null centre of orientation, *their own* kinaesthetical, sensing and feeling lived body) obviously cannot be given in an original

presentation. (In this sense, the experiential gap or asymmetry between the presentation of my own lived body and the appresentation of the other's lived body remains unbridgeable.) In short, in the case of the appresentation of the other, it is his/her lived body which is intended as co-present through the originary presentation of his/her objective body.

The other's objective body then is appresented as another lived body based on a similarity, an analogy between my objective body – which is always also given to me as my own lived body – and the other's objective body. But this analogizing appresentation has nothing to do with an inference from analogy, it is not a „thinking act“, but a direct – performed „at a glance“ – analogizing *transfer of the sense* of my lived body to the other's objective body.²⁹

This analogizing transfer of sense is, on the one hand, a passive synthesis of a *reproductive association*, which is at work in all everyday object-experience when we transfer the originally constituted sense of an object (say the smell of the coffee experienced for the first time) to another actual experience of the same object (the visual perception of a cup filled with coffee). In the present case, I can perceive the other's objective body – which is similar to mine – as a lived body by transferring to it the „primarily insituted“ (Urstiftung) sense of an objective body as being in the same time a lived body. The analogizing transfer of the sense is in the same time a passive synthesis of another type of association, called by Husserl *pairing* or *coupling* (Paarung)³⁰. In a pairing association two (or more) intuitionally distinctively given data form, in a passive synthesis, the phenomenological unity of similarity and thus are constituted as a pair. Pairing leads to a kind of “[...] intentional overreaching [...] a living mutual awakening and an overlaying of each with the objective sense of the other. As the result of this overlaying, there takes place in the paired data a mutual transfer of sense that is to say : an apperception of each according to the sense of the other [...]”³¹ Applied to our case, the objective body of the other form a phenomenological unity of similarity with my objective body, it is constituted as a pair, and as a consequence a transfer of sense takes place: the sense which belongs to my objective body, that of being always also a lived body, is transferred to the similar objective body of the other, which will thereby be appresented as another lived body.

To sum up, in Husserl's account the constitutive moment of intersubjective experience is the direct analogizing perception – through a passive, always already accomplished associative transfer of sense – of the other's objective body as another lived body, i.e. as another null

centre of orientation and another kinaesthetical, sensing and feeling body. This experience of the other as another lived body, as another embodied subjectivity is the precondition of experiencing the meaning of his intentional action, expressive behavior, emotional and mental states.

2.3. Embodied social cognition

If the embodiment of cognition means that mind and cognition is not disembodied and separated from the world, but it manifests itself in a continuous sensorimotor interaction with the world, then embodied social cognition would mean, by analogy, that social cognition neither can be equated with a disembodied mentalizing, but on the contrary, it is embodied in the sense that it manifests itself in the world, it can be directly perceived in embodied actions and expressive behaviors. In opposition to theory-based or simulation-based theories of mindreading, current alternative accounts of social cognition highlights the grounding role of embodied perception and interaction for social understanding. Proponents of *embodied intersubjectivity/social cognition* are arguing that social cognition is grounded in and shaped by – both ontogenetically and phylogenetically, before and below any representational mindreading – the perception, expression and understanding of embodied actions, emotions and intentions. An important related topic in current empirical and philosophical work is the role of the perception and imitation of embodied actions and intentions for the acquisition and evolution of language and culture³² (language and cultural learning, and the capacity of human communication is grounded in intersubjective-perceptual *joint attentional* situations³³; embodied, sensorimotor *mimesis* has a crucial role in cultural evolution³⁴). In what follows, I'll present a phenomenological interpretation of the two most important empirical evidences sustaining the thesis of embodied intersubjectivity/social cognition: mirror neurons in cognitive neuroscience and infant imitation in developmental psychology.

2.3.1. Mirror neurons

Discovered in 1992 by a group of neuroscientists in Parma (Giacomo Rizzolatti, Vittorio Gallese and others), mirror neurons had a deep impact on cognitive neuroscience, leading even to predictions like „mirror neurons would do for psychology what DNA did for biology”.³⁵ Originally discovered in the area F5 of the monkey's ventral pre-motor cortex, and

subsequently identified also in the pre-motor cortex and in Broca's area of the human brain, mirror neurons respond both when a particular action is executed by the subject and when the subject observes the same goal-directed, purposeful action (e. g. goal-related hand actions, such as grasping, holding and manipulating objects) performed by another individual.³⁶ It has been proposed that mirror neurons form a mirror system matching the execution and the observation of goal-related motor actions, a matching mechanism whose primary function is the direct, immediate understanding, relying only on our own motor or kinaesthetic knowledge – without any conceptual-linguistic mediation – of the meaning of other's actions. When we perceive another person's actions or emotions, our motor or emotional system is activated, it resonates along with that of the observed agent; the corresponding internal motor or emotional representations are evoked or simulated, „as if“ we were performing the same action or experiencing a similar emotion. (As if it there would be no difference between seeing and doing or feeling something.) Mirror neurons thus provide a direct internal experience, and therefore understanding of another person's act, intention or emotion. (A few examples can illustrate that mirror neurons can be experienced also in first-person, subjective experience: think of instinctively moving legs or heads while watching a football game; when we see someone laugh, cry, show disgust, or experience pain, in some sense we have a co-feeling of that emotion.) Mirror neuron may underlie a variety of functions like imitation and thereby learning, intention understanding, mindreading, empathy and intersubjectivity,³⁷ and could also represent the basic neural mechanism from which language evolved.³⁸

Understanding the meaning of the actions of others is not a two-step process – as in theories of theory of mind – in which we would first perceive a neither significant, nor expressive bodily behavior, followed by a theoretical inference or simulation which attributes meaning to it. Mirror neurons are receptive not to the physical or biological structure, but to the *teleological structure of the movement*, to the *meaning of purposive, goal-directed actions*. Mirror neurons thus seems to justify Husserl's upholding that our empathic experience of the other implies an actualization of the kinaesthetic sensations corresponding to the movement in question (not its effective execution), through a transfer of sense accomplished by an inter-kinaesthetic coupling.³⁹

Mirror neurons constitute an intermodal link (linking different sensory modalities) between the visual perception of others movement and the first-

person experience of one's own capabilities for kinaesthetic movement. The question is: how this intermodal link comes to be established, or – phenomenologically – how it is constituted?

Some current functional-level explanations, in terms of implicit predictive simulation of action,⁴⁰ suggests that this intermodal link is constituted from “inside out”, from self to the other: it must be first established in one's own case, and then transferable by analogy to the perception of the action of others. The main point of their proposal is that the predictive simulation of the so-called forward models can be bi-directional, can run in reverse. When for example I'm watching my own hand movements, associations are formed between copies of motor outputs for such movements (on the phenomenological level: my own kinaesthetic possibilities or “I can”-s) and visual inputs (appearances) from such movements. This is why copies of motor signals can evoke, or predictively simulate input signals in forward models. (On the phenomenological level this corresponds to the motivational “if-then” correlation between the motivating kinaesthetic systems of possible movements and the motivated sequences of perceptual appearances). But this predictive simulation can also run in reverse: when I see another person moving his hand in a similar manner, the same visual inputs (appearances) can evoke motor outputs (the kinaesthetical possibilities, “I can”-s associated to these movements.) But what about my unperceived movements, like those of my face, were it is impossible to establish these intermodal links between my own kinaesthetically felt and visually perceived movements? (The typical answer is: we use mirrors; but as we will see below in the case of infant imitation, there are no mirrors in the crib, but infants still imitate.)

The same problem arises in the husserlian account of the intersubjective experience: the analogizing perception of the other's lived body is based on the similarity between two objective bodies, between the other's physical body and the visual representation of my own objective body. In order to experience another lived body, I must possess a kind of memory of my own outward physical appearance or of my own moving body from an external perspective. But even if the tactile self-constitution of the body (as in the case of one hand touching the other, discussed before) leads to a certain self-objectivation of my body, I can never move out from my „null centre” of orientation, from my embodied first-person, subjective perspective, in order to perceive visually my own body from an external, third-person perspective. I cannot, as in the case of the other's objective body, walk around my own body and see it from all sides, I cannot perceive some

profiles of it (my head, my eyes, etc.). The adequate, intuitively fulfilled self-constitution of the objective body, especially in the case of visual self-constitution required here, is impossible; as Husserl also acknowledges it in a famous passage from *Ideen II*, the body is a „remarkably imperfectly constituted thing“⁴¹. But if the self-constitution of my own objective body is imperfect and I cannot possess a visual representation of my outward physical appearance or of my own movements from a third-person perspective, then the necessary precondition for the experience of another lived body, that is, the analogizing perception based on a similarity between the two objective bodies, cannot be performed.

In conclusion, both of the accounts, the predictive simulation model and the husserlian description, are facing the same unsurmountable experiential assymetry: my body is experienced primarily in a kinaesthetical way than through visual perception, while the body of another person is experienced primarily through visual perception. Therefore it is highly questionable that I would able to establish first in my own case an intermodal link between the kinaesthetically felt and the visually perceived movements (simply because I cannot experience visually all my movements), in order to transfer it after through analogy to the perception of the movements of others.

A possible solution for this puzzle comes from developmental science: there is evidence now that an ability to appreciate similarities or equivalences between the others movements and unperceived, but felt and executed bodily movements is innate.

2.3.2. Infant imitation

Thanks to the ground-breaking experiments of Andrew Meltzoff, there is now a large amount of evidence showing that newborns (less than an hour old in some cases) can imitate the facial gestures – tongue protrusion, mouth opening, lip protrusion – of another person.⁴² But how do they do this? How do they know that the perceived facial action of the other corresponds to the action performed and felt with their own mouth and tongue which they have never seen before (in order to establish an equivalence between the visual image and the felt action)? For this kind of “invisible imitation” (the infant uses parts of his body invisible to himself to imitate the other’s movements) to be possible, the infant must be capable to match the others facial gestures to his or her own proprioceptive-kinaesthetic experience, that is, he must already

have a developed proprioceptive-kinaesthetic body schema, which is not just *supramodal* (linking vision, proprioception, and action) but also *interpersonal* from the start. There is no need to learn first the intermodal equivalences between the kinaesthetically felt and visually perceived movements, and transfer it after by analogy to the perception of the movements of others, because from the start these senses are linked to each other and to possibilities of action in a supramodal and inter-personal body schema.⁴³ As Gopnik and Meltzoff puts it: "We innately map the visually perceived motions of others onto our own kinesthetic sensations"⁴⁴ If there is indeed an analogy here, this cannot be based on the similarity of two objective bodies (the infant never saw his own face), but more likely on some kind of similarity between the purely *kinematic properties* of the other's visually perceived movements and our own internally perceived movements through kinaesthesia.⁴⁵ We somehow directly co-perceive (co-feel) through our own kinaesthetical possibilities the meaning of the others kinaesthetical movement.

Both Husserl and the contemporary functionalist accounts of mirror neurons seems to follow the same solipsistic logic of constitution: our own self-experience (self-consciousness), which takes place in isolation from others, must foundationally (that is: in the order of constitution) and genetically (or ontogenetically) precede the experience of others. But the phenomenology of neonate imitation requires us to reconsider this solipsistic logic: our own self-experience is in a sense from the start intersubjective. The constitution of others and the constitution of our selves are reciprocally conditioning. In neonate imitation we can literally see our own possibilities in the faces of others, which means that *the intrasubjective (intracorporeal) self-experience is from the beginning intersubjective (intercorporeal)*. In intersubjective situations my own lived body experiences oneself through the relation with another lived body: *bodily auto-affection is in the same time a hetero-affection by another lived body*. The constitutive basis of social experience is thus a direct embodied social perception: we directly co-perceive or co-feel through our own kinaesthetical or emotional possibilities the meaning of the others kinaesthetical movements or emotions. And this intersubjective embodied perception is grounded, constituted in the fact that bodily self-experience is from the beginning intersubjective: my own body is experienced from the beginning as relational, as responsive to the other.

Before concluding, I have to mention that recently not just theories of theory of mind, but to some extent the phenomenology of intersubjectivity

too, have been criticized for neglecting the pervasive dimension of second-person interaction in intersubjective experience, by focusing only on the understanding, prediction and explanation of other's behavior from a third-person observational perspective (his or her behavior or mind).⁴⁶ In opposition, the more recent trend of *embodied or social interactionism* emphasizes the *mutual bodily and affective responsiveness in second-person, pre-linguistic dialogical interaction*.⁴⁷ Developmental evidence about pre-linguistic dialogical interactions in infancy support this view: six- to eight weeks olds already engage in *proto-conversations* with their caregivers, a non-verbal dyadic exchange of vocal, facial, and gestural expressions, which is rhythmically timed and follows a turn-taking pattern (*primary intersubjectivity*)⁴⁸; there is a selective and cross-modal matching between these expressions in infant-mother *affect attunement* for sharing emotional states.⁴⁹ More recently, describing different experiences of emotional second-person engagement in infancy (like experiencing attention, teasing or communicative deception), Reddy suggested that emotions are not pre-given internal states, but relational or interactional affects ("self-other-conscious affects"), whose meaning is constantly changing in the emotional interaction.⁵⁰ In a similar vein, the *enactive theory of intersubjectivity* emphasizes the emergent and autonomous process of "embodied social interaction" (the process of mutual coordination of two embodied subjects coupled to each other), which can generate, by influencing the interactors individual sense-making, a *common or participatory sense-making*.⁵¹ This idea of interactional meaning is an important theoretical innovation of embodied interactionist views, in comparison with previous theories of mindreading or even theories of embodied intersubjectivity.

It seems that both phenomenological and empirical accounts of embodied intersubjectivity are now facing the same theoretical challenge: to step out effectively in the "inter" of intersubjectivity, in that "in-between" which is neither localizable in the brain, nor reducible to mine or the other's intersubjective intentional experience, and where the intersubjective meanings and intentions are not static and pre-given (in interacting individuals), but can be co-created (co-constituted), generated and transformed in the process of embodied interaction itself.

NOTES

- ¹ The initial proposal for a productive dialogue between phenomenology and cognitive science was formulated by Francisco Varela in his working hypothesis of “neurophenomenology”: embodied experience is a locus of epistemological reciprocity between the lived body (the subjective, phenomenal experience of the body) and the objective, scientifically investigated body, a reciprocity which can give place to dynamic reciprocal constraints and to a productive communication between the third-person methodologies and the empirical results of cognitive science and the first-person methodologies and descriptions of phenomenology. For the initial “neurophenomenological” proposal see: Varela, F. (1996). Neurophenomenology: A methodological remedy to the hard problem. *Journal of Consciousness Studies*, 3(4), 330–350.; Varela, F. (1997). The naturalization of phenomenology as the transcendence of nature. Searching for generative mutual constraints, *Alter*, 5(4), 355–381. For recent introductions in the neurophenomenological research program see: Lutz, A., & Thompson, E. (2003). Neurophenomenology: Integrating subjective experience and brain dynamics in the neuroscience of consciousness. *Journal of Consciousness Studies*, 10(9–10), 31–52. There is an ongoing debate about how to “naturalize” phenomenology, whether in the form of neurophenomenology, a front-loaded phenomenology or an indirect phenomenology, etc. See: Petitot, J., Varela, F. J., Pachoud, B., & Roy, J.-M. (Eds.). (1999). *Naturalizing phenomenology*. Stanford: Stanford University Press; Gallagher, S. (1997). Mutual enlightenment: Recent phenomenology in cognitive science. *Journal of Consciousness Studies*, 4, 195–214.; Zahavi, D. (2004). Phenomenology and the project of naturalization, *Phenomenology and the cognitive sciences*, 3, 331–347.; For a recent introduction in the field see: Gallagher, S., & Zahavi, D. (2008). *The Phenomenological Mind. An Introduction to the Philosophy of Mind and Cognitive Science*, London: Routledge. See also the issues of the interdisciplinary journal *Phenomenology and the Cognitive Sciences*.
- ² Turner, B., *The Body and Society*, Oxford, Blackwell, 1984. Featherstone, M., Hepworth, M., Turner, B. (eds.), *The Body. Social Process and Cultural Theory*, London, Sage, 1991. Schilling, C., *The Body and Social Theory*, London, Sage, 1993.
- ³ As Bryan Turner, one of the leading figures of the recent turn to the sociology of the body recently stated there is a persistent tension in the anthropology and sociological study of the body between the body as a representation (that is: cultural decoding of the body as a system of meaning that has a definite structure existing separately from the intentions and conceptions of social actors) and embodiment as practice and experience, the phenomenological study of the lived body. As he puts out concretely: “By treating the body

as a representation, discourse, or text, it becomes difficult to develop an adequate sociology of performance. For example, if sociologists wanted to study ballet as performance rather than as representation, they would need to pay attention to the performing body. The need for an understanding of embodiment and lived experience is crucial in understanding performing arts, but also for the study of the body in sport. While choreography is in one sense the text of the dance, performance takes place outside the strict directions of the choreographic work, and has an immediacy, which cannot be captured by the idea of the body as text. It is important to re-capture the intellectual contribution of the phenomenology of human embodiment in order to avoid the reduction of bodies to cultural texts. The social differences between men and women are consequences of culture, but understanding two people doing the tango requires some attention to bodily performances.” Turner, B., *Body*, in: *The Cambridge Dictionary of Sociology*, Cambridge University Press, 2006, 44.

- 4 Husserl, E. (1973a), *Cartesianische Meditationen und Pariser Vorträge*, Husserliana I (Den Haag: M. Nijhoff), § 44.
- 5 See also: Zahavi, D., *Self-awareness and alterity*, Northwestern University Press, Evanston, Illinois, 91-109. Zahavi, D., First-person thoughts and embodied self-awareness: Some reflections on the relation between recent analytical philosophy and phenomenology, *Phenomenology and the Cognitive Sciences* 1: 7–26, 2002. Gallagher, Shaun, Zahavi, Dan, “Phenomenological Approaches to Self-Consciousness”, The Stanford Encyclopedia of Philosophy (Spring 2009 Edition), Edward N. Zalta (ed.), URL = <<http://plato.stanford.edu/archives/spr2009/entries/self-consciousness-phenomenological/>>.
- 6 Husserl, E. (1952), *Husserliana IV. Ideen II.*, Haye, Martinus Nijhoff, 18. §, a), 56. ; 41. §, a), 158-159; Husserl, E. (1966), *Husserliana XI. Analysen zur passiven Synthesis*, Haye, Martinus Nijhoff Husserl, 1966, 298.
- 7 Husserl, E. (1973), *Husserliana XVI. Ding und Raum*, Haye, Martinus Nijhoff.
- 8 Husserl, E. (1973), *Husserliana XVI. Ding und Raum*, Haye, Martinus Nijhoff., chap. VIII.
- 9 Husserl, E. (1973), *Husserliana XVI. Ding und Raum*, Haye, Martinus Nijhoff., chaps. IX, X.
- 10 The phenomenological conception of active perception has been revived by current enactive, or dynamic sensorimotor theories of perception, which are arguing for the constitutive interdependence of perception and action. Their central claim is that perceptual experience acquires both qualitative character (the subjective feeling of vision, touch, hearing etc) and perceptual content (concerning space, color, shape etc) thanks to a perceiver’s implicit (tacit, know-how) knowledge of “sensorimotor contingencies”, that is, of the effects of movement on sensory stimulation. Perception is not a process in the brain whereby the perceptual system constructs an internal representation

of the world, but a temporally extended, dynamic activity of skillful bodily interaction with the world. See: Hurley, S. (1998) *Consciousness in Action*, Cambridge MA, Harvard University Press.; Noë, A. (2004) *Action in Perception*, Cambridge, MA, MIT Press.; O'Regan, J.K. et Noë, A (2001), A sensorimotor account of vision and visual consciousness, *Behavioral and Brain Sciences*.

¹¹ Husserl, E. (1952), *Husserliana IV. Ideen II.*, Haye, Martinus Nijhoff, 36. §, 146-147.

¹² Husserl, E. (1952), *Husserliana IV. Ideen II.*, Haye, Martinus Nijhoff, 36. §, 145.

¹³ For a philosophical introduction to the field, see: Clark, A., *Mindware. An Introduction to the Philosophy of Cognitive Science*, Oxford, Oxford University Press, 2001.

¹⁴ Two now "classical" and highly influential introductions in the embodied or enactive cognitive science are: the groundbreaking opus of Varela, F., Thompson, E. et Rosch, E. (1991) *The Embodied Mind*, Cambridge MA., MIT Press.; and Clark, A. (1997) *Being There : Putting Brain, Body and World Together Again*, Cambridge, MA, MIT Press. For useful reviews see: Clark, A., An embodied cognitive science?, *Trends in Cognitive Sciences*, 1999, 3 (9), 345-351. Wilson, M. (2002), Six views of embodied cognition. *Psychonomic Bulletin and Review*. 9, 625–636.

¹⁵ Clark 1997, op. cit. ; Gallagher, S. (2005) *How the Body Shapes the Mind*, Oxford, Oxford University Press, 2005; Hurley, S. (1998) *Consciousness in Action*, Cambridge MA, Harvard University Press; Haugeland, J. (1995), *Mind Embodied and Embedded*, in Y.-H. Hounget et J. – C. Ho (ed.), *Mind and Cognition*, Taipei, Taiwan: Academica Sinica.; Lakoff, G. et Johnson, M. (1999) *Philosophy in the Flesh: The Embodied Mind and Its Challenge to Western Thought*, New York, Basic Books; Noë, A. (2004) *Action in Perception*, Cambridge, MA, MIT Press.; Varela, Thompson, Rosch, 1991, op. cit.; Thompson, E. (2007) *Mind in Life: Biology, Phenomenology and the Sciences of Mind*, Cambridge, MA, Harvard University Press.

¹⁶ Thelen, E. and Smith, L. (1994), *A Dynamic Systems Approach to the Development of Cognition and Action*, Cambridge MA, MIT Press.

¹⁷ Damasio, A.R. (1994) *Descartes' Error: Emotion, Reason, and the Human Brain*, New York, Grosset/Putnam.

¹⁸ Brooks, R. (1991) Intelligence without representation, *Artificial Intelligence*. 47, 139–159.

¹⁹ Lakoff, G. and Johnson, M. (1980) *Metaphors We Live By*, Chicago, University of Chicago. Lakoff and Johnson 1999, op. cit.

²⁰ Hutchins, E., *Cognition in the Wild*, Cambridge, MA, MIT Press, 1995.

²¹ Varela et al. 1991, op. cit. Thompson, 2007, op. cit.

²² Lakoff and Johnson 1980, 1999 op. cit.

²³ An example for a conceptual metaphor: The mind (target domain) is a body (source domain). Mappings of the metaphor "Thinking is moving": Thinking

is moving (e.g., “My mind was racing”); Ideas are locations (e.g., “How did you reach that conclusion?”); Being unable to think is being unable to move (e.g., “I’m stuck”); Understanding is following (e.g., “I follow what you are saying”).

- 24 See for example: Gopnik, A. (1993). “How we know our minds: the illusion of first-person knowledge of intentionality”. *Behavioural and Brain Sciences* 16, 1-14. See also: Ravenscroft, Ian, „Folk Psychology as a Theory”, The Stanford Encyclopedia of Philosophy (Fall 2008 Edition), Edward N. Zalta (ed.), URL = <<http://plato.stanford.edu/archives/fall2008/entries/folkpsych-theory/>>.
- 25 See: Goldman, A. (2006), *Simulating Minds*, Oxford, Oxford University Press.; Gordon, R. M. és Cruz, J. (2003) “Simulation Theory” in *Encyclopaedia of Cognitive Science*, London, Nature Publishing.; Gordon, Robert M., “Folk Psychology as Mental Simulation”, The Stanford Encyclopedia of Philosophy (Fall 2009 Edition), Edward N. Zalta (ed.), forthcoming URL = <<http://plato.stanford.edu/archives/fall2009/entries/folkpsych-simulation/>>.
- 26 For the following phenomenological critique of theories of theory of mind see: Gallagher, S., 2005, op. cit., chap. 9.; Thompson, E. (2001). „Empathy and consciousness”. *Journal of Consciousness Studies* 8/5-7, 1-32.;
- 27 Gallagher and Zahavi, op. cit., chap. 9.; Zahavi, D., *Subjectivity and Selfhood: Investigating the first-person perspective*, Bradford Books, The MIT Press. Cambridge, MA, 2008, chap. 6.
- 28 Husserl, E. (1973a), *Cartesianische Meditationen und Pariser Vorträge*, Husserliana I (Den Haag: M. Nijhoff, 141. I replaced Cairns translation of Leib as “animate organism” with lived body and that of Körper as “body” with “objective body”.
- 29 Husserl, E. (1973a), *Cartesianische Meditationen und Pariser Vorträge*, Husserliana I (Den Haag: M. Nijhoff, 141.
- 30 Husserl, E. (1973a), *Cartesianische Meditationen und Pariser Vorträge*, Husserliana I (Den Haag: M. Nijhoff, § 51.
- 31 Husserl, E. (1973a), *Cartesianische Meditationen und Pariser Vorträge*, Husserliana I (Den Haag: M. Nijhoff, 143.
- 32 For a comprehensive survey see: Hurley, S. et Chater, N. (2005), *Perspectives on Imitation : From Neuroscience to Social Science* vol I-II, Cambridge, MA, MIT Press.
- 33 Tomasello, M. (1999), *The Cultural Origins of Human Cognition*, Cambridge MA, Harvard University Press.
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- 36 For reviews see Gallese, V., Keysers, C., Rizzolatti, G. (2004). “A unifying view of the basis of social cognition”. *Trends in Cognitive Sciences*, 8, 9,

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- 43 Gallagher, S. and Meltzoff, A. N. (1996). "The Earliest Sense of Self and Others: Merleau-Ponty and Recent Developmental Studies". *Philosophical Psychology*, 9, 213-236. Gallagher, S. (2001). "The practice of mind: Theory, simulation, or interaction?". *Journal of Consciousness Studies* 5-7, 83-108. Gallagher, S. (2005). *How the Body Shapes the Mind*, Oxford, Oxford University Press, chap. 3.
- 44 Gopnik, A., Meltzoff, A. (1997). *Words, Thoughts and Theories*, Cambridge, MA: MIT Press, 129).
- 45 Smith, A. D. (2003). *Husserl and the Cartesian Meditations*, London: Routledge, 241.
- 46 Ratcliffe, M. (2007). *Rethinking commonsense psychology: A critique of folk psychology, theory of mind and simulation*, Hampshire, Palgrave Macmillan.; Stawarska, B. (2009). *Between you and I. Dialogical phenomenology*, Ohio: Ohio University Press.

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