Intercorporeality as a theory of social cognition

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Theory & Psychology
2015, Vol. 25(4) 455–472
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DOI: 10.1177/0959354315583035
tap.sagepub.com

Abstract

The main aim of this article is to revisit Merleau-Ponty's notion of intercorporeality (intercorporité) and elaborate it as a new theory of social cognition. As is well known, theory of mind has been the central issue in the field of social cognition for more than two decades. In reviewing the basic concepts involved in two major theories (theory theory and simulation theory), I make clear that both theories have been missing the embodied dimension because of their mind–body dualistic supposition. The notion of intercorporeality, in accordance with the recent interaction theory, stresses the role of embodied interactions between the self and the other in the process of social understanding. I develop this notion into two directions and describe the related process of social cognition: one is behavior matching and primordial empathy, the other is interactional synchrony and the sense of mutual understanding. Through these embodied interactions, intersubjective meanings are created and directly shared between the self and the other, without being mediated by mental representations.

Keywords

behavior matching, embodied interaction, interactional synchrony, intercorporeality, Merleau-Ponty, phenomenology, social cognition

Intercorporeality as a theory of social cognition

What does it mean to understand another person? Does it mean accurately guessing the other person's inner feelings by watching facial expressions and gestures? Is it empathizing with the other person while listening to personal stories? Whatever the nature of social understanding may actually be, it is true that theory of mind (ToM) has been the central issue in the field of social cognition for more than two decades. Our everyday mode of understanding the other person has been explained based on ToM, which is generally defined as “the ability to imagine or make deductions about the mental states

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of other individuals” (American Psychological Association, 2009, p. 520). Through ToM, we are able not only to infer the mental states of others but also to predict their consequent behaviors. However, as is well known, there has been a debate between the two major views—theory theory (TT) and simulation theory (ST)—regarding the nature of our ability to understand other people (Davies & Stone, 1995; Doherty, 2009). In recent years, a third view, interaction theory (IT), has established its position in the debate as well (Fuchs & De Jaegher, 2009; Gallagher, 2001, 2004).

In the following, in line with IT, I revisit classic discussions of both TT and ST and examine the very concepts of “theory” and “simulation” in order to clarify a hidden problem shared by both sides: the Cartesian dualistic frame of mind. Both theories conceive of the other person’s mind as something behind his or her overt behaviors (Gallagher & Zahavi, 2012). In other words, the other’s mind is invisible and beyond observable bodily behaviors, so we need inferential or simulative models to approach it. Therefore, understanding another person is equated with indirectly understanding the inner mental realm of that person, which is thought to be private and directly unperceivable. As Gallagher points out, “Both theory theory and simulation theory conceive of communicative interaction between two people as a process that takes place between two Cartesian minds” (2005, p. 211).

Long before ToM, the phenomenologist Merleau-Ponty (1951/1964a) clearly indicated that the Cartesian mind–body dualism is a stumbling block to social cognition. Concerning the infant’s relationships with other people, he asks how social understanding becomes possible if one’s mind is accessible only to oneself, as is presumed in classical psychology. In a sense, this question has been a traditional one for phenomenologists ever since Husserl (1945/1970) first discussed the problem of the other and intersubjectivity in his *Cartesian Meditations*. However, Merleau-Ponty’s contribution to the problem of intersubjectivity was far more practical in terms of considering the present theories of social cognition. By clarifying his notion of intercorporeality based on his text, I will show that his idea shares an important core with the present IT. Then, from this extension of intercorporeality I will abstract two patterns of social cognition: one is behavior matching and primordial empathy, the other is interactional synchrony and the sense of mutual understanding. These two patterns are not intended to deal with higher social cognition directly, but to lay a firm foundation for the most basic aspect of our social cognition in the lifeworld.

Concepts of “theory” and “simulation”

The term “theory of mind” was originally proposed by two primatologists, Premack and Woodruff, in their 1978 article titled “Does the chimpanzee have a theory of mind?” In their experiments, they showed videotaped scenes of a human actor struggling with a problem to a chimpanzee, and then gave him several photographs, one of which indicated a solution to the problem. For example, in one photograph, a human actor in a cage reached for some bananas, but they were too far away. In another photograph, there was a stick that could be used to reach the bananas. Because the chimpanzee consistently chose the correct photograph in the series of experiments, Premack and Woodruff concluded that the chimpanzee had a theory of mind.

Several years later, Wimmer and Perner (1983) conducted a famous experiment with human children to investigate their ability to understand another person's wrong belief.¹ They invented the "false-belief task," illustrated in the following story: Maxi puts a chocolate into cupboard X. In his absence, his mother moves the chocolate to another cupboard Y. After watching a puppet play, the children have to indicate where Maxi will look for the chocolate when he returns. In this task, if the children are able to represent Maxi's inner wrong belief ("The chocolate is in cupboard X") and point to cupboard X, then they are considered to have a theory of mind. The results indicated that none of the children under 4 years of age responded correctly; however, most of the 6- to 9-year-old children pointed correctly to cupboard X. This research suggested that children develop a theory of mind around the ages of 4–6 years.

After the initial experiment by Wimmer and Perner, many versions of the false-belief task were tested by other researchers (e.g., "Sally-Anne task" of Baron-Cohen, Leslie, & Frith, 1985; "Smarties task" of Gopnik & Astington, 1988). These experiments established the standard view that children, in general, gain a representational theory of mind around the age of four; meta-analysis of the test research has supported this view (Wellman, Cross, & Watson, 2001). The false-belief task has also been used with autistic children, and the results suggest that children with developmental disorders have a certain deficit in the ToM mechanism (Baron-Cohen, 1995; Baron-Cohen et al., 1985). However, instead of pursuing a review of applied research, let us examine the very concept of theory, which is presupposed in the term "theory of mind." Premack and Woodruff originally explained theory of mind as follows:

In saying that an individual has a theory of mind, we mean that the individual imputes mental states to himself and to others (either to conspecifics or other species). A system of inferences of this kind is properly viewed as a theory, first, because such states are not directly observable, and second, because the system can be used to make predictions, specifically about the behavior of other organisms. (1978, p. 515)

This passage clarifies that there are two viewpoints included in the concept of theory claimed by TT. First, the other's mental states are something invisible and not observable, which requires us to apply a certain kind of theory. Second, we are able to predict behaviors of other individuals by appealing to and deducting from such a theory. According to TT, understanding another person's mind is a theoretical and inferential process, which is analogous to the natural sciences in applying theory and predicting the courses of natural phenomena (Gopnik, 2009; Suzuki, 2002).

Theory of mind at its core is composed of beliefs, desires, and actions (Astington, 1993). If we know the other's inner beliefs and desires, we are able to predict the subsequent action. For example, you see that your daughter is hungry and you know that she knows there are cookies in the kitchen drawer, so you can easily predict that she is going to eat them sooner or later. In turn, when we observe the other's actions, we can infer that person's beliefs and desires. For example, if you meet a friend on the street and see him rushing to the bus stop, you infer that he believes that he will possibly miss the bus and that he does not want to.

Some philosophers have supported simulation theory as an alternative to TT (Goldman, 1989, 2006; Gordon, 1986). ST is so named because it claims that our ability

to understand another person is not based on theoretical inferences but on self-simulation. The simulation in this theory refers to the mental operation of “putting oneself in the other’s shoes,” that is, putting oneself in the other’s situation using one’s imagination (Gordon, 1986, p. 161). By shifting spatiotemporal perspective and using our past experiences in a similar situation, we are able to imagine how the other person perceives the situation. Consequently, we are able to feel or think what the other person might feel or think. What is crucial in the first step of simulating is to *pretend* to be in the other person’s situation and perceive, feel, and think *as if* we were that person. Then, as a second step, we attribute the resulting mental states to the other person, in a process called “projection” (Goldman, 2006, p. 40). Goldman summarizes the whole process of simulation as follows:

They [those who interpret others] ascribe mental states to others by pretending or imagining themselves to be in the other’s shoes, constructing or generating the (further) state that they would then be in, and ascribing that state to the other. In short, we *simulate* the situation of others, and interpret them accordingly. (1989, p. 168)

Thus, according to ST, pretending to imitate the other’s mental state and attributing the result to that person enables us to predict the other’s behaviors. For example, a police officer who is searching for a criminal might perceive the situation and try to find a safe place to hide, as if he himself were the criminal. Through this simulation, the officer might discover the actual place where the criminal is hiding. Meeting a blind person presents another example. When we encounter someone on the street who seems to be blind, we make way for that person because we imagine the situation that he or she might be in, and thus try to avoid bumping into him or her. Gordon (1986) claims that this holds true in Wimmer and Perner’s false-belief task. Children around the age of four develop the ability to imagine themselves in Maxi’s situation, and therefore are able to predict where Maxi would look for the chocolate.

According to ST, we use introspection of our own mind to simulate the other person’s mind. First, we put ourselves in the hypothetical situation, and based on our past similar experiences we imagine how we would feel, think, and act. Then, by using self-simulation as a resource, we project the results onto the other person’s current mental state and subsequent behavior. Thus, the ability to understand the other person is considered to be preceded by and rooted in our capability for self-understanding. This first-person approach is emphasized in ST.

Phenomenological reconsideration

Now, it is possible to characterize the conceptual difference between TT and ST. TT claims that we practice our understanding of another person’s mind and behavior by referring to commonsense kinds of theories about mind (i.e., folk psychology). ST claims that we understand other people by self-simulating their situations and projecting the results. TT believes that to understand another person, we use objective theory, which can be applied equally to the self and the other (Gopnik, 2009). ST believes that we use subjective simulation, which is projected from the self onto the other. It is clear that TT

takes an observational, third-person viewpoint, while ST takes an introspective, first-person viewpoint (Fuchs, 2013).

I do not attempt here to decide which theory of mind is true. Rather, my aim is to reconsider both theories from the phenomenological perspective—in other words, to consider our daily practice of understanding other people as we experience it. Reflecting on our daily interactions with others, it seems to be true that we sometimes use theory to attempt to understand the other's mind and behavior and, at other times, we put ourselves in their situation to achieve the same purpose. It depends on the relationships, social contexts, or situations within which we *interact* with the other. However, a common characteristic of both processes is that we practice theoretical inferences or simulations in limited situations, where we are unable to directly understand what the other person is saying or doing. For instance, if there is an explicit difference between the self and the other, such as cultural background, age, or gender, this would motivate us to run theoretical inferences or simulations.

In any case, both theories take it for granted that understanding another person is an indirect mental process which needs to appeal to theory or simulation. Both have been criticized by interaction theory (IT) because they fail to consider basic situations in which we have direct interactions with others (Gallagher, 2001, 2004).² Gallagher and Zahavi point out the philosophical assumption that is shared by both theories:

Despite their differences, TT and ST both deny that it is possible to directly *experience* other minded creatures; this is supposedly why we need to rely on and employ either theoretical inferences or internal simulations. Both accounts consequently share the view that the minds of others are completely hidden, and they consider one of the main challenges facing a theory of social cognition to be the question of how and why we start ascribing such hidden mental entities or processes to certain publicly observable bodies. As we have seen, phenomenologists would object to the way this question is framed. (2012, p. 205)

These remarks point out that both theories consider the other person's mind as something private, internal, and hidden behind the observable body. I would like to stress that this supposition is based on Cartesian mind-body dualism (see also Gallagher, 2005; Kono, 2005). The other person's mind, if it exists, is only conceivable by that person in the same manner that I conceive my own mind as an internal realm. The only way to understand the other's mind is to observe the bodily behavior and then infer or self-simulate. In my view, this dualistic supposition is the true problem in the theory of mind debate and needs to be overcome (cf. Merleau-Ponty, 1951/1964a).

From the phenomenological perspective, it is important to note that we are able to directly experience others through our perception. In these experiences, others do not appear as mere physical entities or inaccessible minds, as in the case of Cartesian reflection, but as whole persons who are not divided into the body and mind. Following Husserl, Merleau-Ponty emphasizes that "there is no constituting of a mind for a mind, but of a man for a man" (1960/1964b, p. 169). Within the lifeworld, we usually encounter others as persons and interact with them from a second-person stance. First of all, the interaction between the self and the other should be the focus of social cognition.

There are three notable features of our daily interactions with others. First, the other person we meet in ordinary situations is not differentiated into "interior" and "exterior."

We directly perceive the other's happiness in her smiling face, sadness in his tears, or anger in her clenched fist. The other's gestures, facial expressions, and gaze appear meaningful in themselves (Scheler, 1948/1954). The other's body does not appear as a physical object separated from mental activities in a dualistic way. The minds of others are possibly hidden from us when they lie, keep secrets, or deceive; however, this does not mean that their minds are theoretically hidden and private (Kono, 2005).

Second, our interactions with others are basically embodied. For example, if someone smiles at us, we will naturally smile back. If someone points a finger in a certain direction, we will look for an object in that direction. If someone pats us on the shoulder, we will turn around to find out who it is. The most fundamental social understanding is expressed through such embodied interactions, which is a chain action-reaction between the self and the other (which we will examine below). This process includes mutual understanding of each other's intention of action. Even after we attain a theory of mind, the social understanding based on embodied interaction continues to be fundamental (Fuchs & De Jaegher, 2009; Gallagher, 2005).

Third, the other person appears in a concrete action in a shared context. The other person is not a physical entity in a vacuum, but a living body embedded in the world: he or she is engaged in a certain action, oriented toward other persons, objects, and the environment. If someone is standing at a bus stop, we perceive her intention of waiting for the bus to go to some destination. If someone picks up the phone, we understand his need to talk with another person. The other's bodily movements always appear to us as meaningful actions, which manifest their own intentions, needs, and goals in a certain context.³ Expressed in a phenomenological term, we understand the other person as a "being in the world" (Merleau-Ponty, 1945/2012).

In short, we use embodied interactions to understand the other person, taking the second-person viewpoint in a common context. This process, of course, does not assure a precise understanding of the mental states of the other, but it is not as obscure as theoretical inferences or inner simulations, which consider the other's mental states as something not directly accessible. What is needed is the understanding of the other's mental states in expressive continuity with their bodily behaviors (Gallagher & Zahavi, 2012).

It should be remembered that Husserl (1945/1970) originally focused on the relation between my body and that of the other when he attempted to articulate the foundations of intersubjectivity. In my perceptual field, the other's body first appears as a physical object (*Körper*) in the same way that other physical objects appear. However, I perceive it as a lived body (*Leib*), which is similar to mine, through the process of pairing (*Paarung*).⁴ Thus, at the most fundamental level, our visual perception of the other body allows it to appear as the other person or the other subject of action, which is different from a mere physical object.

Merleau-Ponty's notion of intercorporeality

In our reconsideration of the current problem of social cognition, we can now move on to Merleau-Ponty, who reformulated this point in a far more sophisticated and practical way. He first proposed the notion of "intercorporeality" (*intercorporéité*) in his late essay on Husserlian phenomenology, "The Philosopher and His Shadow" (Merleau-Ponty,

1960/1964b). Using the word “shadow,” he attempts to focus on theoretical issues—embodiment and otherness—that were left unconsidered by Husserl. (Needless to say, the “philosopher” in the title indicates Husserl.) In this essay, since intercorporeality is also referred to as “carnal intersubjectivity” (*intersubjectivité charnelle*), it is evident that Merleau-Ponty is trying to open a discussion on intersubjectivity in close connection with the idea of embodiment. In the background of this notion lies the problem of other mind, as is the case with ToM.⁵

First, the notion of intercorporeality requires us to change our view of the mind. Referring to the development of infants’ social cognition, Merleau-Ponty states, “We must abandon the fundamental prejudice according to which the psyche is that which is accessible only to myself and cannot be seen from outside” (1951/1964a, p. 116). As seen above, this is exactly what was required in the case of ToM. Intercorporeality, then, focuses on the relation between one’s own body and that of the other to illuminate intersubjectivity and social understanding in an alternative way. The problem of social cognition should not be set up as a problem of communication between two Cartesian minds, as Gallagher (2005) argued above. Here, I would like to quote four related passages from Merleau-Ponty’s texts to clarify the notion of intercorporeality as much as possible.

- (a) “Each one of us [is] pregnant with the others and confirmed by them in his body.” (1960/1964b, p. 181)

This passage, from “The Philosopher and His Shadow,” emphasizes that each of us is connected with others through our own body in a special way (“pregnant” and “confirmed”).⁶ However, the reality of the connection remains ambiguous here. The following passage from “The Child’s Relations with Others” explains this in a more concrete way:

- (b) “In perceiving the other, my body and his are coupled, resulting in a sort of action which pairs them. This conduct which I am able only to see, I live somehow from a distance. I make it mine; I recover it or comprehend it. Reciprocally I know that the gestures I make myself can be the objects of another’s intention.” (1951/1964a, p. 118)

According to this passage, it is clear that our connection through the body is based on perception, especially that of another’s action. Merleau-Ponty states that the self “lives” the other’s action from a distance by perceiving it, and the self comprehends the meaning of that action by doing so. Perceiving the other’s action does not mean observing it in a detached way but tracing it through the body in a pre-reflective way. We can better understand this point through the next quote, which is from his *Phenomenology of Perception*:

- (c) “A fifteen-month-old baby opens his mouth when I playfully take one of his fingers in my mouth and pretend to bite it. ... “Biting” immediately has an intersubjective signification for him. He perceives his intentions in his body, perceives my body with his own, and thereby perceives my intentions in his body.” (1945/2012, p. 368)

A 15-month-old baby, as soon as he perceives the adult's action of biting, echoes the same action even though he does not explicitly know whether his face structurally corresponds to that of the adult in front of him. The baby pre-reflectively acknowledges through his body (i.e., through his motor capacity) the adult's intention of biting, and as such the intention to bite is shared intersubjectively between the baby and the adult. The last passage refers to this point:

- (d) "Communication or the understanding of gestures is achieved through the reciprocity between my intentions and the other person's gestures, and between my gestures and the intentions which can be read in the other person's behavior. Everything happens as if the other person's intention inhabited my body, or as if my intentions inhabited his body." (1945/2012, pp. 190–191)

The word "gestures" in this passage can also be read as "actions" within the context of our discussion.⁷ There is reciprocity between my intentions and another's actions and between another's intentions and my actions. Consider again the baby's case: perceiving my action of biting, the baby carries out his own intention to bite. This occurs as if my intention inhabited the baby's body, and thus, as we saw in passage (a), I am confirmed by the baby in its body.

In the passages quoted above, we can almost discern the meaning of intercorporeality. However, I would like to add two ordinary but illuminating examples, which can help us understand the notion even more clearly. The first example is yawning. It is well known that yawning is highly contagious. In fact, it is a common experience that we cannot help yawning when we see someone else yawn. Interestingly enough, it has been remarked that children with autism have difficulty with contagious yawning (Senju et al., 2007). The other example is smiling. Generally, smiling is not as contagious as yawning. However, when we come upon an innocently smiling face, we may feel that the muscles around our mouth are about to mimic the same facial expression, even though we do not actually smile (Schilbach, Eickhoff, Mojzisch, & Vogeley, 2008).

Thus, we can now understand the notion of intercorporeality, as shown in Figure 1 (Tanaka, 2013, p. 103). Intercorporeality contains a perception–action loop between the self and the other. Perceiving the other's action prompts the same action in the self (like contagious yawning) or the possibility of the action (like smiling). Conversely, the self's action prompts the same action, or its possibility, in the other's body. In this way, each one of us is "pregnant with the others," as Merleau-Ponty expressed it in passage (a). Therefore, it is understandable that intercorporeality is also referred to as "carnal intersubjectivity." Merleau-Ponty aimed to reformulate intersubjectivity as a problem of communication not between two Cartesian minds, but between two minded-bodies (Tanaka, 2014a).

In terms of social cognition, through this reciprocity between bodies, we directly grasp the intention of another's action, as claimed by direct social perception theory (Gallagher, 2008). For the self, to perceive another's action is potentially to take up the same action. Thus, it is through our motor capacity that we understand the meanings of the other's action (Kono, 2005). Our basic ability to understand others is perceptual,

Figure 1. Structure of intercorporeality.

sensorimotor, and non-conceptual (Gallagher, 2004). The most primary form of social understanding is to directly grasp another's actions through one's own body and find one's own possibility of actions in another's body. This understanding precedes the theoretical inferences or inner simulations put forward in theories of mind. Merleau-Ponty's notion of intercorporeality makes it possible to understand social cognition from an enactive perspective (Fuchs & De Jaegher, 2009; Noë, 2004; Varela, Thompson, & Rosch, 1991). Perceiving the other person is not passively receiving the stimuli but actively seeking for potential actions, as we will discuss below.

Behavior matching and primordial empathy

Since Merleau-Ponty's death in 1961, many empirical cases have been reported in social and developmental psychology that support the notion of intercorporeality, although they were not directly inspired by Merleau-Ponty. The following cases are well known in these fields:

1. Reflexive crying (Simner, 1971): newborn infants have a strong tendency to cry in response to another newborn's crying.
2. Neonate imitation (Meltzoff & Moore, 1977): newborn infants imitate an adult's facial expressions, such as opening and closing the mouth or sticking out the tongue.
3. Postural congruence (LaFrance & Broadbent, 1976; Schefflen, 1964): during communication in pairs or a group, a similarity in participants' postures is often observed (e.g., crossing the legs, head propping).
4. Matching in vocalization (Cappella, 1981): in infant–adult dyadic interactions, infants consistently match their vocalization in timing and duration to those of the mother.
5. Motor mimicry (Bavelas, Black, Lemery, & Mullett, 1986): when a person witnesses another's emotional expressions (e.g., wincing for pain), he or she mimics the same movements, including facial expressions.

Similar to contagious yawning, these cases involve our natural tendency to imitate others' actions. This tendency is observed not only in newborns but also in adults and includes a broad range of nonverbal behavior such as facial expressions, paralanguage, postures, gestures, movements, and mannerisms (Nagaoka, 2006). Most of this mimicry is unintended, unconscious, and automatic, which Chartrand and Bargh (1999) call "the chameleon effect." In consequence of this kind of mimicry, emotional contagion is naturally induced (Hatfield, Cacioppo, & Rapson, 1993), and people are often able to converge emotionally. In all instances, more than two people show a similarity in nonverbal behavior, especially in bodily actions, which Bernieri and Rosenthal (1991) conceptualize as "behavior matching."

It seems appropriate to refer to the mirror neuron system in this context (see Iacoboni & Mazziotta, 2007, and Rizzolatti & Craighero, 2004 for reviews). As is well known, mirror neurons are a special type of neuron that become active when someone performs a specific movement and also observes someone else performing the same movement. Neurons in the brain of an observer reflect the action of the other, as if the observer were acting in the same way. The functions of mirror neurons have been considered in relation to fundamental human capacities, such as language acquisition (Rizzolatti & Arbib, 1998) or tool use (Ferrari, Rozzi, & Fogassi, 2005).

Naturally, however, the primary importance of their function is in understanding the meaning of another's action. Immediately after quoting passage (d) above from Merleau-Ponty's *Phenomenology of Perception*, Rizzolatti and Sinigaglia state the following:

The "act on the spectator's part" is a potential motor act, determined by the activation of the mirror neurons that code sensory information in motor terms thus enabling the "reciprocity" of acts and intentions that is at the root of our ability to immediately understand what we see others doing. ... As soon as we see someone doing something, either a single act or a chain of acts, his movements take on immediate meaning for us, whether he likes it or not. Obviously, the converse is also true: our actions have an immediate value for those who observe them. (2008, p. 131)

As we have already seen above, to perceive another's action does not necessarily provoke the same action; however, it draws out its possibility in the self, that is, potential behavior matching. The activation of mirror neurons primarily seems to correspond to this latent behavioral process. From our viewpoint, the mirror neuron system is one of the neural correlates of intercorporeality: the neural basis for the perception-action loop between the self and the other.

In past debates on ToM, mirror neurons have been interpreted as a sort of empirical evidence supporting simulation theory (Gallese & Goldman, 1998; Goldman, 2006). According to this view, the activity of mirror neurons can be considered as an implicit and subpersonal process that simulates the other person's behavior. However, what the mirror neuron system basically suggests is a *direct* understanding of the other's action and its intention through perception, as indicated in the passage cited above. It does not correspond to *indirect* mental simulation but rather to the perception of action, which constitutes a part of intercorporeality.

As the mirror neuron system is considered to be the basis of empathy (Gallese, 2001), it is reasonable to think that the aspect of intercorporeality that appears as behavior

matching forms the underlying process of empathy. In the standard view of cognitive science, empathy is conceived as shared cognition, including feelings and thoughts between two individuals, that is, two independent minds. For example, Decety and Jackson say that “empathy accounts for the naturally occurring subjective experience of similarity between the feelings expressed by self and others without losing sight of whose feelings belong to whom” (2004, p. 71). Empathy in this sense is a sort of vicarious experience, which presumes the independence of the self and the other.

However, the empathy we need to discuss here is a more primordial and embodied one. When the perception–action loop between the self and the other appears as behavior matching, that is, unintended and unconscious mimicry, feelings and emotions that occur do not belong to any independent mind in the strict sense. Consider the case of reflexive crying. It is clear that crying newborns may share a certain emotion, but it is difficult to know whose emotion it derives from originally. There is a type of empathy that does not belong to the individual but to the “in-between” of the self and the other.

Here, we find the crucial difference between ST and intercorporeality. The former stands upon the standard view of empathy, where the self has a vicarious experience of another through simulation. In other words, one’s own feelings and thoughts are initially different from those of the other, but they become similar and create an experience of empathy after a simulation routine. Thus, one can keep track of “whose feelings belong to whom,” unlike the case of reflexive crying. This is the empathic social understanding asserted by ST.

In contrast, intercorporeality traces back the origin of empathy to the reciprocal relation between the self’s body and that of the other. Through the perception–action loop, both the self and the other begin participating “in-between,” which occasionally induces mirroring behaviors at the observable level. The same behavior is subjectively experienced as embodied empathy, which belongs neither to the self nor to the other. For example, consider members of the audience in a concert hall, listening to the music in an identical pose as if mirroring each other. In this case, the intentionality of consciousness is directed to the music but temporarily acts from “in-between.” Speaking more generally, mirroring behavior offers an opportunity for the self and the other to live the same intentionality of consciousness by experiencing the same action: laughing at something, distorting the face for something, reaching toward something, and so on. And thus, the self and the other happen to merge into the same impersonal emotional state through the shared intentionality. This is what we claim here as primordial empathy. Concerning the phenomena of primordial empathy, we can remember that Merleau-Ponty also stated, “He and I are like organs of one single intercorporeality” (1960/1964b, p. 168).

Interactional synchrony and the sense of mutual understanding

From the viewpoint of nonverbal behaviors of interpersonal communication, intercorporeality appears not only as behavior matching but also as a meshing of each other’s actions, which is formally termed “interactional synchrony” (Bernieri & Rosenthal, 1991; Julien, 2009; Trees, 2009). Synchrony “describes the coordination and timing of movements and includes simultaneous movement, tempo similarity, and coordination or

smoothness" (Trees, 2009, p. 257). In communication research, behavior matching and interactional synchrony—or, simply, "matching and meshing"—are generally considered to be two basic types of interpersonal coordination that occur in social encounters with others (Knapp & Hall, 2010).

As is the case with behavior matching, various cases of synchrony are also reported in the fields of social and developmental psychology. According to the classical findings, even 2-week-old infants are able to synchronize movements of their hands, head, and legs to an adult's speech patterns (Condon & Sander, 1974). Similar coordination is also seen between adults: the flow of movements in the listener rhythmically corresponds to the speaker's vocalization (Kendon, 1970). The capacity of joint visual attention is another example (Scaife & Bruner, 1975). Babies aged 9 months can follow the direction of the mother's gaze and look at the same object. Thus, from the very early stage of development, before ToM is established, the other's action is perceived as something meaningful that provokes a related reaction in the self. This resonant bodily relation, as shown in the case of joint visual attention, is extended to share the object and the goal of action. From the very start we have the capability of resonant action, including both matching and meshing, and we learn to understand the other's intention of action through this ability. Interactional synchrony is just as primordial as behavior matching, as a part of embodied interaction with others.

Synchrony constitutes another phenomenal aspect of intercorporeality because the perception–action loop between the self and the other does not always appear as mirroring behavior (Tanaka, 2013). Rather, it appears in much larger part as embodied interactions of action and reaction. Perceiving the other's action, we immediately grasp its intention through our own body, and then react in response to that. In our daily interactions with others, we more often produce a meaningful reaction than take a similar action. For example, if a speaker lowers his or her voice and starts to whisper, the listener will naturally lean closer toward the speaker to identify what is being said. If an interaction partner hands a note to us, we will hold out our hand to receive it without deliberation. The reaction toward the previous action then causes a subsequent reaction, and thus the process continues. In other words, in communication we mesh the flow of actions with one another, as if we were dancing together. Interactional synchrony is this kind of well-timed and meaningful interpersonal coordination, the basis of which is the rhythmical circulation of action and reaction between the self and the other.

It is important to add that this circulation is based on the embodied perception of each other's body in action. From the enactive viewpoint, perception is not a process of passively receiving stimuli from the environment. On the contrary, it is a process of exploring possible action toward the environment, based on embodied skills (Noë, 2004). For example, for those who know how to swim, a lake does not only appear as an expanse of water glistening in the sunlight but also as a place that affords swimming. To perceive the environment is to know the possible action to take in that environment (cf. Gibson, 1979). Perception is a sort of implicit and practical knowledge, that is, embodied knowledge (Tanaka, 2011, 2014b).

Therefore, in the context of interpersonal communication, the other's action is perceived as affording a reaction in some manner. Gallagher also writes, "Others present us with social affordances." (2012, p. 76). As seen above, the self directly understands the

intention of the other's action, and thus, perception of the other's body solicits the self's reaction that responds to that intention. Conversely, and in turn, the self's action is perceived as affording the other's reaction in response to the intention. The self and the other are reciprocally seeking potential action through each other's perception, as a result of which the "inter-action" is created. The process by which the interactional synchrony is generated is not mediated by an intellectual mental operation, but is rather based on the embodied perception and skills of each interaction partner.

From this viewpoint, it is possible to redefine behavior matching as a limited type of interactional synchrony in which a reaction similar to the other's action is afforded. In behavior matching, one partner's mirroring action is not intended as a reaction in response to a previous action of another. Instead, the partners unconsciously share the same intention of action, and in so doing they experience a state of primordial empathy.

By contrast, interactional synchrony in general is more relevant to the sense of mutual understanding. It facilitates the communication between the self and the other through a smooth exchange of nonverbal behaviors (e.g., flow of gestures, turn-taking of utterances, postural changes, regulation of distance, etc.) based on an intuitive grasp of each other's intention of action. Embodied interaction that is experienced as interactional synchrony is in itself intersubjectively meaningful. Consider the case of a jazz music improvisation. Interactional synchrony of the performances of each player creates a new and one-time-only tune, through which the players comprehend each other. At a certain moment during the performance, the synchronized interaction gains its autonomy, as if it achieves a life of its own. Fuchs and De Jaegher appropriately describe this type of interaction as follows:

The coordination of their body movements, utterances, gestures, gazes, etc. can gain such momentum that it overrides the individual intentions, and common sense-making emerges. ... Each of them behaves and experiences differently from how they would do outside of the process, and meaning is co-created in a way not necessarily attributable to either of them. (2009, p. 476)

The "meaning" that emerges from embodied interaction does not necessarily take concrete or propositional forms, but often appears as various emotional tones of the interpersonal field, such as convivial, collaborative, cohesive, confrontational, competitive, intensive, dispersed, centripetal, centrifugal, and so forth. These tones comprise the context of social cognition, in which the self and the other have the sense of mutual understanding. Explicit understanding that unfolds through verbal communications is what emerges on the basis of these senses of mutual understanding. In this regard, social understanding is not a process of cognition but of creation through interaction.

Conclusion

We have examined the possibility of giving a new account of social cognition based on the notion of intercorporeality. According to Merleau-Ponty's writings, intercorporeality refers, first of all, to the reciprocity of one's own body and that of another. The other's body appears to the self not as a mere object (*Körper*) but as the living body in action

(*Leib*). This is where the perception–action loop between the self and the other occurs: perceiving the other’s action prompts the same potential action in the self and vice versa. This reciprocity supports the most basic type of social cognition, that is, understanding the intention and meaning of the other person’s actions. Mirror neurons seem to be the neural correlate of this basic understanding.

In the interpersonal communication process, intercorporeality appears in two different manners: behavior matching and interactional synchrony. In behavior matching, two or more participants in communication show similar nonverbal behavior, such as facial expressions, gestures, or vocalizations. Because people engaged in matching often converge emotionally, intercorporeality is considered the basis of empathy. However, this empathy is primordial and derives from feelings and emotions that occur “in-between” the interactants. Interactional synchrony appears as the rhythmical circulation of action and reaction between the self and the other. Understanding the intentions of each other’s actions, we mesh the flow of nonverbal behavior in communication. As a result of meshing, we arrive at a new phase in the sense-making process, through which we have the sense of mutual understanding.

According to the current major theories of social cognition, we are able to understand others only by indirect means: applying a theory to the other’s behavior in order to understand the hidden motivation (TT), or imagining the other’s thoughts and feelings by simulating the other’s situation (ST). However, intercorporeality suggests an immediate and direct understanding of the other person. At the fundamental of social understanding lie embodied interactions between the self and the other, through which various impersonal emotional states are created. This fact introduces a new point of view on social cognition: understanding another person is not a cognition processed only by the self but a *creation* between the self and the other. Where there are two persons, embodied interactions bring forth various impersonal emotions in forms such as moods, atmosphere, and ambiance of the interpersonal field. Most of these are experienced in an implicit and pre-reflective manner, but they are certainly shared through bodily resonance as something intersubjectively meaningful. Here, as Merleau-Ponty thought, intercorporeality unfolds literally as “carnal intersubjectivity.” The self can understand the other without running theories or simulations, as far as this intersubjective meaning is shared through bodies. This process occurs as a form of mind-reading, since both are actually able to read each other’s subsequent action and its intention, or to feel each other’s emotional state. The self and the other can directly share what is being created between two bodies, without being mediated by mental representations.

Acknowledgements

Earlier versions of this paper were presented at the 30th and 32nd International Human Science Research Conferences. I thank the participants in my sessions for their valuable feedback. I also thank Thomas Fuchs for his comments on the first draft of this paper.

Funding

This work was supported by the Japan Society for Promotion of Science KAKENHI (Grant no. 24500709).

Notes

1. This experiment was originally designed in response to Dennett's (1978) criticism on Premack and Woodruff's claims about ToM.
2. In relation to this, Fuchs and De Jaegher (2009) point out that the current concept of social cognition has at least four points that must be reconsidered: (a) "inner world" hypothesis (conceiving the mental as an enclosed inner realm), (b) missing interactions, (c) missing embodiment, and (d) missing development.
3. A note regarding this point is in order. In contemporary society, which includes diverse contexts within the lifeworld, direct understanding of another's actions and their intentions might be problematic at times. For example, I may take the other's staring at me with curiosity as a gaze that is intended to offend. This kind of misunderstanding might happen in direct social perception, when an implicit difference, such as sexuality, gender, social class, or disability, is embedded in a shared context.
4. Pairing is a particular association through which the meaning of a living organism is transferred to the other body on the basis of its similarity to my body, which I know is animated directly through my own experiences (Husserl, 1945/1970).
5. In his lecture on child psychology, Merleau-Ponty (1951/1964a) asks not only how social understanding becomes possible for infants, but also how infants become able to attribute mental states to the other. According to Merleau-Ponty, both questions should inevitably be asked if psychology presupposes the idea that one's mind is accessible only to oneself.
6. It should be noted that this word does not literally mean pregnancy. The French word "prégnant" has the general meaning of "implicated" or "rich in connotation."
7. We discuss here the meaning of actions that appear in the interpersonal domain and are perceived by others. They can be included as gestures, because Merleau-Ponty (1945/2012) did not restrict gestures to be actions that are intentionally oriented to others. All the actions we take in socially shared situations are potential gestures.

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