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## The Intersubjectivity of Embodiment

Although studies centering on both embodiment (Gibbs 2006, Johnson 1987, Violi 2007; Borghi & Pecher, 2012; Wilson, 2002) and intersubjectivity (Malle & Hodges 2005) are flourishing, it is only in recent years that crosstalk and research bridging them has started being systematically pursued (Marsh *et al.* 2009, Tylén, *et al. accepted*, Zlatev *et al.* 2008).

On the one hand, embodiment has often been presented as a sufficient explanation for all sorts of cognitive functions, grounding them in basic human sensorimotor skills. Thus, the body has implicitly been conceived as an unproblematic and pre-existing object, detached from its social and cultural contexts (*cf.* Violi *this volume*). On the other hand, intersubjectivity has been conceived as a question of independent individuals learning how to read each other's mind in order to interact (*cf.* De Bruin and De Haan *this volume*). That said, embodied and intersubjective foci of research are coming together, deeply reshaping the human conception of human cognition.

Indeed, new signals are emerging in the last years, and two different movements can be recorded. Cognitive and neurocognitive scientists have started to devote more attention to the intersubjective aspects of cognition (e.g., Galantucci & Sebanz 2009, Semin & Smith 2008). The much debated discovery of the mirror neuron system (for a review, see Rizzolatti & Craighero 2004) has given a great impulse to this kind of research, as has the development of psychological theories – such as the common coding one, showing that humans rely on their own motor system while observing and predicting actions performed by others (e.g., Sebanz *et al.* 2006). Even if the enthusiasm for the social aspects is signalled by the birth of a novel discipline “social neuroscience”, it is still a matter of controversy among cognitive (neuro)scientists to what extent intersubjectivity is intended as foundational or not.

At the same time, the influence of the bodily processes and the role of embodiment are starting to be recognized within disciplines that are traditionally more inclined to focus on the social dimension. In the past twenty years, anthropology (Csordas 1994, 2008), linguistics (Geeraerts & Cuyckens 2007), and semiotics (Landowski 2005) rediscovered the role of the body in shaping social interactions. However, this interest has sometimes led to an over-estimation of embodiment (*cf.*

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Fontanille 2004, Violi *this volume*), and the body has become the isolated fundament of meaning for individuals who, only in a second moment, get to interact.

The aim of this special issue is to bring together researchers embracing different approaches – neuroscientists, psychologists, semioticians, linguists, philosophers, and anthropologists – to outline principles that could provide an intersubjective foundation for embodiment.

The perspective that emerges is that one's body and basic sensorimotor skills, which constitute a crucial structure for most of one's cognitive processes, are, in important ways, intersubjectively distributed. Emotional and interactional rhythms in early infancy are crucial in shaping cognitive development (*cf.* Reddy 2008, Violi *this volume*, Trevarthen *this volume*). Slightly later in development, narrative frames and other sociocultural practices also play a crucial role in defining a shared structure for joint attention, pointing, and re-enactment of both successful and unsuccessful acts (Sinha & de Lopez 2000). These mechanisms are not limited to crucial periods in cognitive development but keep unfolding during the whole existence of the organisms. Dance is a wonderful example of this: the continuous interaction between the bodies of the participants, partially constrained by the sociocultural constraints of the specific dance enacted, gives rise to self-organized collective patterns of movements not reducible to the individual (*cf.* Kimmel *this volume*).

Not only are these embodied bases of cognition emerging, at least partially, from intersubjective interactions; but also, intersubjectivity is a much more basic and embodied activity than previously thought. Intersubjectivity is shared bodily engagement that partially defines the subjects that take part in it. Cultural practices and semiotic systems – such as language – build upon and extend these mechanisms. In this way, one can finally see the possibility for a more polyphonic dialogue, in which more socially oriented approaches (anthropology, semiotics, linguistic, sociology, etc.) contribute to the grounding of cognitive phenomena. Such dialogue is expressed in the eight contributions to this thematic issue of *Cognitive Semiotics*.

All of the papers in this issue take a social perspective on embodiment: that is, they all dispense with the long-held assumption in cognitive science that perception, action, and cognition can be understood fully by investigating single individuals. The papers are also connected because they all investigate intersubjectivity as composed of at least two levels:

1. Intersubjectivity as the articulation of continuous interactions *in praesentia* between two or more subjects.
2. Intersubjectivity as sedimented socio-cultural normativity: i.e., of habits, beliefs, attitudes, and historically and culturally sedimented morphologies.

It is exactly within the network of connections between these two levels of intersubjectivity that embodiment takes on its semiotic status. Through this shared arena for cognition, the possibility for communication and for signs is established. Through embodied interactions – in early infancy, but not only then – the relevant body structures acquire their salience.

In the remainder of this introduction, we provide a brief synopsis of the papers in this issue.

The first two papers originate from infant research. They investigate the role of intersubjective interactions in prime infancy in defining the way cognition and meaning-making are developed and enacted.

Colwyn Trevarthen develops the idea that human life and one's being in the world with a body are constituted by intersubjective rhythms. According to Trevarthen, all vertebrate life is characterized by the capacity to appraise the relevant environment emotionally: i.e., by its "adaptive vitality". That said, human subjects originate in interaction with others, thanks to awareness of those others along with innate responses to their evaluations. Already from prime infancy, first emotional rhythms and then the joint tying of actions to pragmatic contexts – the construction of shared, implicit narrative frames – define the basic, goal-directed nature of human behavior and the shared representational infrastructure needed to read the minds behind overt movements. On this basis, a culturally manmade world of artifacts, symbolic language, and arts is possible.

Analogously, Patrizia Violi argues – on the basis of infant observation and developmental psychology studies – that intersubjectivity is the very basic device that translates embodied actions and experiences into semiotic reality through a series of steps, from forms of tuning to a more complex system of mediation with reality itself. Intersubjectivity – by creating a level of sharedness – triggers and enables the coordination and co-construction of embodied experiences.

The third paper complements this focus on infancy by investigating the tight texture of intersubjectivity in one specific kind of adult interaction: improvisational pair-dance *tango argentino*. Michael Kimmel conceives the dance as a sort of real-time conversation between two bodies, one that implies the use of different cognitive and intersubjective resources. This "anomalous conversation" is investigated by a mix of phenomenological interviews, apprenticeship diaries, and ethnographic participation focused on what enables the two dancers to move in unison and improvise dance while they feel – but do not know exactly – the other's intentions. Individual skills and dynamic sensing routines combine to create an emergent, super-individual imagery that reduces the cognitive complexity of the tasks the subjects need to accomplish, permitting them to manipulate these tasks more easily.

The following four papers debate the role of intersubjectivity leading to the development of a more explicit semiotic dimension: *gestuality* and eventual multimodal linguistic interactions.

Relying on neuro-imaging findings, Gentilucci and colleagues highlight the connection between hand and arm-related mimicry and language-related mouth movements. Initial communication, based on intersubjectively coordinated arm gestures, is argued to be at the origin of language use. This connection remains active in the productive merging of speech and symbolic gestures in syncretic semiotic structures, which acquire a richer meaning than any of their isolated components.

Mats Andrén investigates the connection between language and gestures in their function of motivating the stature and role of objects, as well as in action completion. By analyzing rich video

material of children in social interaction, Andr n displays the complex interplay of continuous corporeal dynamics and linguistic and social conventions.

Liesbet Quaeghebeur tackles the mechanisms that enable the integration of multiple modalities, proposing a theoretical model of “all-at-onceness” versus the sender-receiver, coder-decoder picture. Relying on Merleau-Ponty, Quaeghebeur articulates a comprehensive framework for conceiving of conversational interaction as a process whereby embodied dynamics both constitute and are constituted by the intersubjective arena.

Paul Sambre pushes further the need to ground one’s understanding of meaning and intersubjectivity in phenomenology. He explores the notions of intersubjectivity and embodiment throughout the whole production of Merleau-Ponty, in order to critically enrich cognitive linguistics. Body and intersubjectivity meet and intertwine in complex ways through language. The body appears as a foremost cultural yet partially undefined object that enables mutuality and reciprocity: a first level of intersubjectivity. However, it is only through language that meanings transform into a system of expression, and the body can be fully expressed and thus defined. The “natural” body – even in the most basic perceptual functions – becomes a discursive and linguistic body, in which intersubjectivity plays an even greater role than before the advent of language. Language thus provides the key that fully accomplishes the inter-definition of embodiment and intersubjectivity.

Last but not least, Leon de Bruin and Sanneke de Haan explore how much the basic forms of continuous, embodied intersubjectivity can explain higher forms of social cognition. They develop a model of intersubjectivity grounded on the de-coupling and re-coupling of embodied interactions. The body, in its active dimension, is thus – from the start – open to the other and so grounds intersubjectivity. This intersubjectivity is widely enlarged by the use of (linguistic and culturally situated) narrative practices, which still deeply involve embodied dimensions.

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