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ON THE EMBODIED NATURE OF COMMUNICATION

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WHAT IS THE ROLE AND RELEVANCE OF THE BODY IN COMMUNICATION? There is no single, simple answer to this question, and in contemporary cognitive science there are completely different views of how to consider the issue. In this paper I address the issue from an *embodied cognitive science*¹ perspective. Nevertheless, the most common, as well as still dominant, view of the role of the *body* in communication is as a trivial ‘appendage’ to the real intellectual mind. Therefore, bodily aspects are frequently addressed in terms of *non-verbal communication*, *nonverbal behavior*, or *body language*.² This can be partly explained by the view of regarding ‘mind’ as superior and/or independent of the ‘body’, which subsequently considers bodily social interactions (such as gesture, posture and so on) merely as the visible result and output of mental intentions. Consequently, it is suggested that agents relate to each other in communication much the same way as they relate to other parts of the external world, that is by having more or less explicit internal symbolic representations of each other, which then are manipulated internally (cf., e.g., Quinn, Macrae & Bodenhausen 2003). In other words, the *computer metaphor of mind* is a centralized view of cognition, taking place inside the skull with the body only serving as some kind of input and output device, i.e., a physical interface between an internal program (cognitive processes) and an external world.

Theories of embodied cognition have during the past two decades offered a radical shift in explanations of the human mind, emphasizing the way cognition is shaped by the body and its sensorimotor interaction with the surrounding social and material world. Thus, embodiment has become a much discussed concept (e.g., Gallagher 2005, Gibbs 2006, Lakoff & Johnson 1999, and Varela, Thompson & Rosch 1991), and usually referred to as ‘embodied cognitive science’, it portrays a much more complex picture of the mind. This means, it stresses the interplay between the environment, the brain and the body’s sensorimotor processes, which are pivotal for cognitive activity to take place. Thus, embodiment might offer a non-dualistic explanation without conceiving the mind as a mental sphere correlated with its physical realm. As Lakoff and Johnson characterize it:

...the mind is embodied, not in any trivial sense (e.g., the “wetware” of the brain runs the “software” of the mind), but in the deep sense that our conceptual systems and our capacity for thought are shaped by the nature of our brains, bodies, and

¹ The terms *embodied cognitive science*, *embodied cognition*, *embodiment*, and *embodied action* are here used interchangeably. For a more thorough clarification, see, e.g., Lindblom (2007:9-14).

² It has been estimated that nearly two thirds of the meaning in spontaneous communication is ‘received’ from so-called non-verbal signs (Burgoon, Buller & Woodall 1996).

bodily interactions. There is neither no mind separated from and independent of the body, nor are there thoughts that have an existence independent of our bodies and brains. (1999:265)

- 5 Broadly speaking, *embodiment* refers to the experiences that arise from the living body in its interactions with a material/physical as well as a social and cultural world.

The aim of this paper is twofold. First, it portrays the significance of embodiment in meaning-making activity, by presenting an integrated understanding that supports and explains the relationships that actually exist between embodied actions and cognition³ in communication. Secondly, it aims to further investigate and analyze the role and relevance of interacting socially through embodied action,⁴ offering additional empirical evidence in favor of current theoretical work. Analyzed data, collected from spontaneous meaning-making activity in a real life situation, reveals some unforeseen issues concerning embodied speech-gesture combinations.

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1. EMBODIMENT IN MEANING-MAKING ACTIVITY. Recent work in embodied cognitive science and related disciplines indicates that embodiment plays several important roles in meaning-making activity, but there is no unified framework that addresses why and how this is accomplished from an embodied perspective. I would like to address this issue by intertwining findings from different research areas in order to emphasize the significance of embodiment. Due to space limitations, I only show only a few examples that significantly stress the importance of embodiment in meaning-creating activity. (For more details, see Lindblom 2007, especially chapters 4–6).

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- 25 1.1. SOCIAL PSYCHOLOGY. Empirical evidence from social psychology has demonstrated how social thought and judgments can be affected by bodily states, actions and motivations. Barsalou *et al.* (2003) have identified the following four kinds of social embodiment effects.

Firstly, perceived social stimuli do not only produce cognitive states, but also bodily states. For example, it has been reported that high school students who received good grades in an exam adopted a more erect posture than students who received poor grades. Moreover, subjects primed with concepts commonly associated with elderly people (e.g. ‘gray’, ‘bingo’, ‘wrinkles’) exhibited embodiment effects such as slower movement when leaving the experimental lab, as compared to a control group primed with neutral words.

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- 35 Secondly, the observation of bodily states in others often results in bodily mimicry in the observer. People often mimic behaviors, and subjects often mimic an experimenter’s actual

³ Due to the interdisciplinary nature of this paper, it is worth mentioning that there are some problems with the vocabulary. While the aim is to move beyond the traditional dichotomies of mind/body, cognitive/bodily, verbal/ non-verbal communication, and so on, sometimes these concepts are nevertheless applied because they are accepted and commonly used terms.

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⁴ From an embodied cognitive science perspective, an embodied action, e.g., a gesture, is not considered to be a manifestation of an internal cognitive process (as in computationalism) but rather as an element of cognitive activity. Thus, an embodied action is a form of cognition, and not an expression or output of internal cognitive processes.

behavior, e.g., rubbing the nose or shaking a foot. Subjects also tend to mimic observed facial expressions, emotions, and so on, which is widely documented in the literature.

Thirdly, bodily states produce affective states, which mean that embodiment not only facilitates a response to social stimuli but also produces tentative stimuli. For example, subjects rated cartoons differently when holding a pen between their lips than when holding it between their teeth. The latter triggered the same musculature as smiling, which made the subjects rate the cartoons as funnier, whereas holding the pen between the lips activated the same muscles as frowning and consequently had the opposite effect.

Fourthly, compatibility between bodily and cognitive states enhances performance. For instance, several motor performance compatibility effects have been reported, in which subjects responded faster to 'positive' words (e.g., 'love') than 'negative' words (e.g., 'hate') when asked to pull a lever towards them.

These examples, among several other studies showing similar effects, demonstrate the strong relationship between so-called bodily and cognitive states in communication. In short, the bi-directional swapping between these states occurs automatically without any higher knowledge structure, supporting an embodied perspective.

1.2. PHENOMENOLOGICAL ASPECTS AND SOCIAL NEUROSCIENCE. Current findings in social neuroscience provide strong evidence for an embodied interpretation of meaning-making activity. For instance, simulation theories and work on mirror-neurons are good examples of more embodied views of communication (Rizzolatti *et al.* 2002; Gallagher 2005, 2007). In short, the simulation account argues that cognitive processes are achieved by the reactivation of the same neural structures used for physically sensing, moving and acting in the environment, but also in communication and meaning-making activity. Gallagher for instance, stresses that the understanding of the other person is a kind of "embodied practice" (2007:208, 216–30).

Such an understanding may rely on a resonance mechanism, being part of special kinds of visio-motor neurons in the premotor cortex in the macaque monkey brain, namely mirror neurons, which exemplify how perception, action, social cognition, and even speech come together at the level of single neurons. Mirror neurons are located in area F5 in the monkey brain and become activated both when performing specific goal-directed hand (and mouth) movements and when observing or hearing about the same actions (Kohler *et al.* 2002, Rizzolatti *et al.* 2002). Because mirror neurons respond to both conditions, it has been argued that the mirror system functions as a kind of "action representation." Consequently, this mirroring mechanism enables the agent to understand the meaning of the observed action by embodied reactivation. This means, even while only observing the actions of another individual, a neural "triggering" event in fact takes place in the observer. Accordingly, the linking between action and perception offers an 'intuitive' understanding of the observed action, i.e., what it means to do it and what the action really is about.

Consequently, Gallagher argues that phenomenologically, when one sees another person's action or gesture, one directly perceives or immediately 'sees' the meaning in the action/ gesture, without the need to model it at a higher cognitive level. Thus, his major point is that the neural systems "are activated by the other person's action". Thus, "the other

person has an effect on us” (2007:8–9). Hence, this implies that bodily actions might activate as a social resonance mechanism in the process of perceiving others, which may constitute the very foundations of the particular social cognitive phenomena.

Moreover, it has been speculated that the mirror system might be a basic mechanism necessary for imitation and attributing mental states to others (e.g., Rizzolatti & Arbib 1998, Rizzolatti *et al.* 2002). Taken together, the consideration of the mirror neuron system and simulation theories as the neurobiological underpinning of communication, provides significant examples of embodied views of meaning-making activity.

1.3. COMMUNICATION AS GROUNDED IN EMBODIMENT. The traditional, but artificial, divide between verbal vs. non-verbal interaction in linguistics may be bridged from an embodied perspective. Iverson and Thelen (1999), for instance, stressed that the hand and the mouth are tightly coupled in communication. They demonstrate converging empirical evidence which suggests that the systems of hand and mouth movements are not two separate systems. Rather, they should be viewed as an integrated communicative “speech-language-gesture” system, linking action, thought and cognition.

Some researchers have argued that conceptualization and language understanding cannot be achieved through the manipulation of amodal, arbitrary symbols alone but have to be grounded in the body’s interaction with the environment (Lakoff & Johnson 1999), and there are empirical results that support a close coupling between language and action (Glenberg & Kaschak 2002, Willems & Hagoort 2007).

Gesturing is a significant aspect of communication, and it constitutes a pan-human ability that provides important information to the listener, since gesture offers speakers the means of expressing thoughts difficult to articulate in speech (Goldin-Meadow 2003; McNeill 1992, 2005). For instance, a so-called gesture-speech mismatch occurs when the speaker’s speech and gesture convey different information, and the ‘extra’ ideas that are found in mismatches are only conveyed in gesture. Gesture-speech matches then occur when the same information is conveyed in both speech and gesture at the same time (Goldin-Meadow 2003). Furthermore, gesturing may be a form of processing initial ideas that are shadowed but not hidden, and gesture and speech complement, but do not compete, with each other (Goldin-Meadow 2003; McNeill 1992, 2005). Accordingly, gesture is a natural part of communication, and enables people to embody their thoughts in action.

Interestingly, the human homolog to area F5 in the monkey brain is Broca’s area, which has several crucial functions in language production (Arbib 2005). Rizzolatti and Arbib (1998) suggest that phylogenetically speaking, the human mimetic and communicative capacity is a natural extension of the action-recognition mechanism based on mirror neurons. Also McNeill (2005) emphasizes the ‘thought-language-hand’ link in communication, originating between area 44 and 45 in Broca’s area, highlighting the double characteristic of speech and gesture, i.e., functioning both inwardly as well as outwardly. He stresses that area 44 is mainly responsible for the organization of action sequences, whereas area 45 is the part that contains many mirror neurons, which he suggests became self-responding to one’s own actions subsequently imbuing them to contain meaning. During phylogeny, these two systems became co-opted in order to unite manual gesture and vocalization. This means,

speech and gesture evolved *together* to embody meaning. The crucial shift in the function of mirror neurons occurred when they began to respond to significances other than the actions themselves, providing the basis for recognizing the actions of others (McNeill, 2005). Hence, this co-opted system seems to be a part of a circuit for recognizing intentional goal-directed actions from one's own actions or from others, by the fact that gesture signifies things other than the actions themselves. Consequently, meaningfulness emerges from the ability to reactivate a social reaction of another in yourself, a way of reacting to your own actions similarly to the actions of others. That is, communication is relational, given that the meaning is both experienced as well as 'mirrored' in both the person performing the action and in the observer. This is a more complex way of portraying interaction than the more static idea of a 'sender' and a 'receiver' in communication (Fogel 1993).

Thus, from an embodied perspective, the reactivation of the mirror neuron system might function as the glue that binds hand, mouth, action and speech together, but future work is needed to further clarify the relation between these issues in communication

1.4. FOUR FUNDAMENTAL FUNCTIONS OF EMBODIMENT. The work presented above offers highly complementary rather than alternative views on the role of embodiment in communication. By integrating these perspectives, we can obtain a deeper understanding of the issue, without bypassing the effects of embodiment. Based on the previous ideas and empirical findings, I have identified four fundamental functions of embodiment in communication (Lindblom 2007):

- The body functions as a social resonance mechanism.
- The body functions as a means and end in communication and social interaction.
- Bodily actions and gesture function as a helping hand in shaping, expressing and sharing thoughts.
- The body functions as a representational device.

1.4.1. THE BODY FUNCTIONS AS A SOCIAL RESONANCE MECHANISM suggests that there is no need to decode or represent embodied social stimuli to more 'advanced' or cognitive states since the bodily states in themselves actually are cognitive states, as related work portrays. Hence, this first function portrays how cognitive and bodily states of the interacting partners are reflected both in themselves and in between them.

1.4.2. THE BODY FUNCTIONS AS A MEANS AND END IN COMMUNICATION AND SOCIAL INTERACTION. The suggested linkage between 'action' and 'action-perception' provided by the mirror neuron system implies that the body and its sensorimotor processes are 'cognitive' in themselves. The great benefit of this action-understanding linkage, beside its parsimony, is the inbuilt *dual* ability of grasping both the 'what' and 'why' aspects of the present action, i.e., what the action is about as well as catching the intention behind the movement. Hence, this second function stresses how bodily actions operate both outwardly and inwardly in meaning-making activity.

1.4.3. BODILY ACTIONS AND GESTURE FUNCTION AS A HELPING HAND IN SHAPING, EXPRESSING AND SHARING THOUGHTS. Besides speech, manual gesture is a significant (embodied) aspect of meaning-making activity, which may provide important information to the listener, since gesture offers speakers the means of expressing thoughts difficult to articulate in speech. Through gesturing, we are able to generate and embody dynamical associations between different matters, which can offer new insights to the present situation or problem at hand. In addition, gesture sometimes serves as an explicit instance of the action-meaning embodied in speech, suggesting that hand movements are physical externalizations of the speaker's ideas.

1.4.4. THE BODY FUNCTIONS AS A REPRESENTATIONAL DEVICE. In addition to speech, there is the more controversial claim that non-vocal embodied action also has representational properties, where certain kinds of gesture, portraying representational aspects, are the most obvious examples of the body as an external representational device. The neurological roots of this ability might be the activity of the mirror neurons, since their linkage between 'action' and 'action-perception' might propose a kind of 'action representations' that are directly enacted in communication. Furthermore, since mirror neurons seem to 'understand' the goal of the action, it can be argued that the grasping of the action does not require a declarative understanding, since it is meaningful in itself.

2. EMPIRICAL WORK. In order to illustrate the significance of embodied action in meaning-making activity, a naturalistic inquiry was conducted. The case study was carried out during a guided tour at a ranch which maintains and preserves herds of Spanish mustang horses.

2.1. THE CHOSEN APPROACH. The focus of analysis was how we embody our thoughts in action through gesture, speech, posture, and gaze in meaning-making activity, which go far beyond the bounds of internal symbolic mental processes. Hence, the unit of analysis considers both the persons' spoken words and bodily actions, and the social situation at hand, which in many cases actually provides meaning to the embodied actions. The participants were the head of the ranch, Bob, and Katrin, who was the head of a group of visitors. The data collecting technique used was participant observation with video recording, which then was analyzed at micro-level via 'frame-by frame' analysis, from an ethnographic perspective.

Due to space limitations, I only present a short analyzed episode that exemplifies how embodied action matters in meaning-making activity (see Lindblom 2007:203–52 for more details). It should be noted, however, that the four fundamental functions of embodiment are not always explicitly mentioned below, but they serve as the ways to explain and describe how meaning-making activity presumably is embodied.

2.2. ANALYSIS AND RESULTS – 'THEY OWN ME'. In the following analyzed sequence⁵, lasting approximately 6 seconds, Bob tells us about his relationship with the horses, and the dialogue proceeds as follows:

⁵ However, the dynamic and situated nature of socially embodied actions result in some problems when representing and illustrating them in "stiffer" mediums such as verbal descriptions and two-

- [1] Bob “everyone says to me – ‘how many horses do you own?’”
 [2] Bob “I don’t—they own me” (then Katrin says “yeah”)
 [3] Katrin “...How many horses own you?” (followed by laughter)
 [4] Bob “yeah... really”

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Just before Bob begins his utterance and during the verbalization of the first one, he leans his body slightly forward. While Bob verbally utters “everyone says to me”, in a fairly alert and easy-going tone of voice that is also reflected in a delighted facial expression, he also makes a little and quick manual gesture. When he continues the utterance, saying “...how many horses do you own?”—still with the same tone of voice and facial expression—he once again moves his hands. This time, however, the gesture is bigger in scope and more manifested, given that it is molded by both his hands, having its ‘peak’ during the pronunciation of “horses”. The entire gesture unfolds in less than a second, but seems to be a significant part of his speech-gesture match. Hence, the gesture match highlights horses, which can be interpreted as the central issue of the utterance, but the gesture also serves as an indicator of the numbers of horses, providing an ‘answer’ to how much ‘many’ actually is. That is, the gesture-speech combination both serves as a mismatch and a match in this case, because the wider gesture with both hands indicates that the number of horses is not very small but quite large.

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Before Bob continues, he turns his head and gazes toward Katrin and the others, offering them his focus of attention, without explicitly looking at Katrin. This indicates how the interaction is co-regulated, given that Bob does not take anything for granted and the shift in focus of attention and slightly altered bodily posture are ways of establishing and maintaining the unfolding interaction. Katrin’s slightly altered bodily posture toward Bob indicates that she is still an active partner in the meaning-making activity. Bob subsequently utters, in a teasing and ironical tone of voice, “I don’t - they own me.” During the first part (“I don’t”) Bob once again makes a similar quick and outward gesture with his hands as previously, but this time it is more loose and ill-defined. This gesture can be interpreted as highlighting that he does not own the horses, but the interesting part unfolds when he says “—they own me”. The entire pronunciation takes less than three seconds.

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After the gesture performed during the verbalization of “I don’t”, he makes a short pause before saying “- they own me”. Meanwhile, he moves his hands upward and toward his thorax, but without touching it (**Figure 1a**, overleaf). However, when he utters “they”, the toward motion ends and takes the opposite direction instead, moving away from his thorax (**Figures 1b–c**). That is, the change of direction of the action occurs exactly during the verbalization of “they”, and during the rest of the verbalization, the outwardly action continues (**Figure 1d**). When Bob has finished his utterance, he holds his hands motionless in that particular position for a while (**Figure 1d**) and Katrin then says “yeah”. Her agreement is also manifested in her tone of voice, which is positive and rising, but rather quiet. Moreover, she slightly shifts her focus of attention to Bob.

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dimensional photographs, which are the media used here. The dynamics of embodied actions are better displayed in the actual video recording, and ideally, it would be preferable if the readers of this paper were able to actually view the video clips being analyzed so they could observe my analysis of the sequences themselves.



Figure 1. The gesture in form of bodily actions toward and from the thorax performed during the verbalization of “—they own me.”

Next, Bob moves his hands again into a more widespread gesture which he maintains for a time (**Figure 2**).

Meanwhile, Katrin paraphrases Bob’s utterance by saying, in a quiet, but rising and joyful tone of voice, “...How many horses own you?” during which she very rapidly changes her focus of attention from Bob, toward the horses, and then looks back at Bob (**Figure 2b–d**). Hence, Bob’s participation in the interaction is indicated by the changes in gesture; bodily posture and facial expression, and Bob’s gesture ends when Katrin utters “own” and he holds his hands along side his upper body when she finishes her question. During her utterance, he also shrugs his shoulders, holding them in the upward position for a moment. Additionally, his facial expression changes, displaying the emerging meaning they create together. His face changes from a stricter, resolute expression into a grin with closed lips. Meanwhile, he lowers his shoulders (**Figure 2d**). When Katrin has finished her utterance, Bob nods in agreement. Then Bob says “yeah... really” in a more ironic and falling tone of voice. As indicated in **Figure 2d**, they both lean toward each other and then laugh, and the laughter occurs just after the end of the verbal expression. This is interpreted as a way of showing their agreement of understanding through embodied, cross-modal meaning-making activity.

Broadly speaking, this episode illustrates how ubiquitously present speech-gesture matches and mismatches are in communication, sometimes serving as deliberate attention devices for certain kinds of information. Thus, gesturing has a significant communicative intention, as well as serving as a way of shaping and expressing Bob’s own thoughts.

Further analysis of Bob’s mismatch reveals earlier unforeseen but significant aspects concerning the embodied nature of meaning-making activity. Bob’s upward gesture towards



Figure 2. The co-regulated bodily actions performed by Bob and Katrin while Katrin utters "...How many horses own you?"

his thorax (Figure 1), is considered an example of the fourth social embodiment effect, i.e., that compability between cognitive and bodily states enhances performance, although Barsalou *et al.* (2003) did not consider gesture and communication. This means the motion towards his chest is easier to make when the issue at hand is something positive than something negative. However, he changes the direction of the gesture very quickly, just before he actually would have touched his chest, and the 'toward gesture' takes the opposite direction, outward. The actual change of direction happens when he utters 'they' which represents the horses. When the sentence is completed, he holds his hands still for a while, and then makes a bigger and more widespread gesture which he 'freezes' during a pro-longed moment while he shrugs his shoulders. These embodied actions are interpreted as ways of representing the bizarreness of the utterance, namely that the horses should own him. In order to highlight the conflicting meaning expressed, he makes a certain kind of mismatch. In other words, Bob makes an intentional mismatch, as opposed to the more unintended mismatches that Goldin-Meadow (2003) describes. It is important to point out that Katrin actually grasps the underlying meaning of the odd utterance, by paraphrasing his verbal expression in a joyful and teasing tone of voice, and the following laughter also serves as a way of manifesting the emerging meaning while she leans towards Bob. Realistically, the horses cannot own him; however, emotionally, his devotion to the horses implies they 'own' his full attention.

3. SUMMARY AND DISCUSSION. This paper has integrated different aspects on the embodied nature of communication, resulting in an embodied framework which explains and

shows how socially embodied actions are crucial parts in ongoing meaning-making activity in situ. This implies that one's own understanding of other agents' minds is more than the exchange of communication signals, and although the current knowledge cannot explain in detail the complexity of human communication, it does shed some light on how the interacting partners are able to share the communicated meaning in the dialogue. I argue that embodiment is the part and parcel of communication and cognition in the most general and specific ways, in which dynamically embodied actions themselves are both cognitive and communicative. Thus, if we cut the 'body' from the 'mind', we will no longer be human cognizers. The body is always communicating to us, so to speak, through its embodied actions. Most generally, the gap between body and mind is fictitious. Instead, one must mind the body in communication and cognition.

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