BEYOND CARTESIAN SOLIPSISM: IS THERE A DIRECT PERCEPTION OF ANOTHER PERSON'S FEELINGS AND INTENTIONS?

Commentary article on M.N. Eagle & J.C. Wakefield, "Gestalt Psychology and the Mirror Neuron Discovery"*

Franz Mechsner

How is it possible that we know about another person's feelings and intentions? Traditional wisdom largely embraced the solipsistic Cartesian intuition that direct, immediate and valid knowledge is only possible about oneself. We can cross the border to the world of objects and other persons only by way of fallible inference. In particular the true feelings and intentions of other persons are hidden by their very nature because as a matter of principle, these are genuinely private. We may feel the painful truth in this intuition if we realize having misinterpreted a friend's feelings or if we fear not being able to understand important aspects of them. On the other hand, in our everyday life, more often than not we have no difficulty in understanding feelings and intentions of other persons. This experience of being able to virtually read another's mind is so strong and convincing that one might be tempted to ask: Is there a kind of immediate and reliable perception of another person's feelings and intentions, a direct route to another person's mental world? The philosopher Levinás (1987) even argued that only the immediate and direct encounter with other human beings (rather than abstract knowledge about their mental states) is fundamental for any meaningful human relationship, and for our being in the world as social and empathizing persons. However, as this possibility would imply that the mind is not as private as the Cartesian intuition so convincingly has claimed it to be, it is hard to imagine how such a direct perception should work.

In light of the persuasive power of the Cartesian intuition that the mental is genuinely private, it is fascinating to learn that there have been scientific attempts to put this traditional claim into serious question. Only recently, Gallese, Rizolatti and co-workers developed a theory of action recognition and empathy claiming the possibility of a direct perception of intentions and emotions, without intervening cognitive steps (Gallese 2003a,b; Gallese and Goldman 1998; Rizolatti, Fogassi, and Gallese 2001, 2002; Rizolatti and Gallese 2006). Thereby they relied crucially on their earlier discovery of so-called mirror neurons (Gallese et al., 1996; Rizolatti et al., 1996). In a recent article in *Gestalt Theory*, Eagle and Wakefield (2007)

* *Gestalt Theory 29* (1), 59-64

claim that the discovery of mirror neurons as well as the related theorizing had in important aspects been anticipated by speculations of the German Gestalt psychologists Köhler (1924, 1947) and Koffka (1924, 1935), namely in their "isomorphism" hypothesis that can be traced back to earlier ideas by Wertheimer (Luchins and Luchins 1999).

Indeed, in spite of some obvious differences, the relevant passages in Koffka's and Köhler's works are an astonishingly parallel read to the mentioned papers by Gallese and Rizolatti. In addition, both lines of work seem to enlighten each other in a quite inspiring synergistic way when it comes to thinking about the other´s minds problem. I will try to explain what I find interesting, even exciting, here. In the following I will give a sketch of both the "embodied simulation" theory by Gallese and Rizolatti and the "isomorphism" hypothesis by Koffka and Köhler, and consider what they have to say regarding the other minds problem, thereby expanding upon the remarks by Eagle and Wakefield (2007). Finally, I will consider exemplarily one of the problems with these concepts, namely how they deal with the fundamental psychological concepts of function, intention and goal-directedness.

In Köhler's own words, the isomorphism hypothesis suggests that there is a fundamental "…similarity between sensory experience and accompanying physiological processes" (Köhler 1947, 160). Which kinds of similarities are thought to be of importance here? For instance, topological neighbourhoods in visual space are preserved as topological neighbourhoods in the brain: "Relative localization of objects in visual space will be regarded as correlated with relative positions of corresponding local processes within the visual area of the brain" (Köhler 1947, 209). Such a correspondence does not have to be picture-like, but could emerge from a mapping of visual space to some abstract space provided by the layout and functioning of the brain. Central to the idea of isomorphism is also the notion of "self-distribution" that anticipates the modern concept of self-organization. According to Gestalt theory, perceptual structures are characterized by "spontaneous grouping in sensory fields" governed by Gestalt laws. It seemed reasonable to assume that this phenomenon originated in spontaneous grouping processes in the brain caused by the stimulus pattern – a "self-distribution" of collectives of matter, according to Köhler following the tension of the effective forces until these forces reach their balanced equilibrium (which is pre-determined by the stimulus pattern).

How could a model of this kind enlighten the problem of how we recognize other's feelings, experiences and intentions even if they don't tell us? Köhler addresses this issue at some length in his book "Gestalt Psychology" (1947, 216-247). First, he criticizes the widespread belief that we cognitively infer mental events in other persons from their bodily behaviour, by constructing an analogy to our own experience (such as: "If I knit my frown, I am usually angry, thus that woman knitting her frown is probably angry.") He then goes on to claim that perception does not simply register the raw physical movements. Instead, he argues that perceived behaviour may well be "imbued" with emotional and intentional qualities that can thus be directly perceived (much like a perceived "+" is imbued with its meaning as a symbol for adding, thus it is perceived directly as "adding"). A second route to a direct perception of inner states is made possible because overt behaviour often resembles the corresponding mental

events in important characteristics. Such an isomorphism makes possible that emotional qualities (and qualities of other inner states) are directly revealed as perceptual qualities of the corresponding behaviour. To repeat the example reported by Eagle and Wakefield, calm movements might reveal a calm mood, thus calmness can directly be perceived. Though Köhler claims a fundamental similarity or even equivalence of movement perception and execution, he does not explicitly use this idea in his speculations on mind reading, though it seems quite plausible that understanding, say, the meaning of other´s movements implies components that could be called active (executional) and passive (sensitive) at the same time. I still ask myself why Köhler did not investigate the notion that emotions and intensions might actually be identified with perceptuo-motoric Gestalt qualities which seems to me a quite obvious option in this context (this idea would resonate with a recent theory that emotions are basically communicative - via external, overt, bodily expressions directed at other persons or oneself, and via internalized, covert, bodily expressions directed at oneself, see Holodynski 2004; Holodynski and Friedlmeier 2006).

Now let us have a look at the theory of "embodied simulation" by Gallese and Rizolatti (Gallese 2003a,b; Gallese and Goldman 1998; Rizolatti, Fogassi, and Gallese 2002; Rizolatti and Gallese 2006). This proposal gives the so-called mirror neurons as discovered by these authors (Gallese et al., 1996; Rizolatti et al., 1996) a prominent role. Mirror neurons were first discovered in the premotor cortex of macaques: these cells fire if the monkey moves his arm as well as if he observes another monkey or human move his arm. To note, this happens only, if the respective movement is goal-directed and meaningful – these neurons would not respond to the mere physical gesture. A corresponding mirror system could be made plausible also in humans. Analogous phenomena could be observed with emotional expressions (for details see Eagle & Wakefield 2007). Taking serious the hypothetical conclusion that observation and execution of goal-directed and meaningful movements share the same neuronal substrate, Gallese and Rizolatti hypothesize that this neuronal substrate makes possible a direct perception of other persons' emotions and intentions. The strong similarities of these proposals to the isomorphism hypothesis are obvious, as pointed out by Eagle and Wakefield (2007).

The attractive idea that emotions, experiences and intentions of other persons could possibly be perceived directly thus seems to put in severe doubt some fundamental traditional convictions concerning mind and body: If it is basically correct, the conviction that the mental is essentially private and cannot be observed, by its very nature, is fundamentally mistaken. Also, the conviction that movement and perception, active and passive processes are well-distinguished and separate, is mistaken. As these convictions are fundamental not only for philosophy but also for conceiving our personal and social life, this is extremely exciting and certainly worth exploring more in-depth, theoretically and experimentally.

There are, of course, also problems with both lines of theorizing whose clarification might bring us closer to a convincing and more comprehensive theory of mind reading. Only to point out one of them, both hypotheses still seem to have problems how to understand, in a scientific world view, the functional, purposeful or even explicitly goal-directed character of mental content and human actions.

Both lines of theorizing emphazise that human actions are purposeful, meaningful and goal-directed. However, there is no place for purpose, meaning and goals in material nature as conceived by physics and chemistry. Thus, if one accepts that any scientific approach finally has to be conceived in terms of physics and chemistry it is a fundamental problem to interpret purpose, goals and meaning in the living and mental world. Köhler addresses this enigma by doubting it: He proposes that purposeful behaviour is actually not so specific for living beings. He points out, that purpose-analogous processes are actually ubiquitous in physics, as for instance in the tendency of a drop of water (say, in free fall in a vacuum) to end up in a spherical form, independent of the starting form. He claims that mental processes are in fact isomorphic to physical processes in the brain, namely the spontaneous transformation, or "self-distribution" towards an equilibrium of forces. This idea certainly anticipates modern proposals of attractor-guided quasi-physical biological and psychological self-organization (e.g., theories of relaxation-processes in neuronal networks, biological and psychological applications of Haken's "synergetics" etc.). However, it is misleading to interpret function simply in terms of physical attractors. This is nicely illustrated by the fact that the physical and physiological operating principles in cortical neuronal networks (including the existence of physical attractors) remain the same with any thinkable distribution of synaptic weights. But only very few of these networks, namely those whose input and output support an organism's life, could meaningfully be ascribed to have a function. Thus the existence of physical attractors is certainly not equivalent to having a function. (In addition, modern theories of biological pattern formations state that living patterns are only possible far from thermodynamic equilibrium.)

In contrast, Gallese and Metzinger (2003) acknowledge that function, meaning and goal-directedness as characteristics of the psychological level cannot directly be reduced to physical concepts. They emphasize that mental content is structured according to a so-called motor ontology, which means that our perceived world is characterized by the existence of autonomous intending selves, meaningful actions and goals. Though useful for guiding behaviour, this ontology is to be considered illusory: "From a strict scientific point of view, no such things as goals exist in the objective world" (Gallese and Metzinger 2003, 370). In consequence, a project of naturalization of functionality would thus mainly be concerned with the way the brain constructs reality in terms of motor ontology rather than with how an acknowledged reality of functionality, of autonomous intending selves, meaningful actions and goals might be understood in terms of natural sciences (see Metzinger 2003). This proposal appears a little dogmatic, as "a strict scientific point of view" is not at all a priori and by definition restricted to physical and chemical concepts. One might instead follow Mayr (1979) in concluding from a long controversial discussion of the issue that ultimate concepts like function, purpose and goal-directedness are not only acceptable, but actually fundamental and defining for the life sciences. The world of function and goal-directedness can certainly not be connected to the world of physics by way of a synchronous emergence relation (analogous to, say, "temperature" and "average velocity of molecules"), but its emergence from the physical world (and thus the origin of information) can in principle be understood and explained by way of evolutionary considerations (Mayr 1979; Eigen 1971).

As the space limit of a commentary is already overstretched, I will only name a few other problems for further discussions: How are the mechanisms of empathy distinguished from mere emotional contagion? How can recent experiments and ideas on joint action like those by Sebanz and colleagues be helpful in this discussion (Sebanz, Bekkering and Knoblich 2006)? Can a mental representation of function and goals be understood by relating it to functional roles and properties of the physiological substrate or is the mental characterized by concepts that transcend the biological, e.g. the concept of the autonomous person (which then cannot have, by its very nature, an isomorphic correlation in the brain)? If so, is it possible to justify a scientific use of such concepts in a similar way to the use of ultimate concepts in the life sciences has been justified?

In any case, much food for thought seems to emerge from considering the isomorphism hypothesis and the embodied simulation theory together. We have to thank Eagle and Wakefield for directing our attention to the connection.

Summary

Eagle and Wakefield (2007) point to similarities between the classical "isomorphism" hypothesis by Koffka and Köhler (saying that there are fundamental parallels between mental and brain processes) and the recent "embodied simulation" theory by Gallese and Rizolatti. I consider these contemplations further, with a focus on the claimed power of both theories to enlighten the possibility of a "direct perception" of other persons' mental experience. Though there is considerable power of both theories to make plausible the possibility of direct mind-reading, some problems remain still to be solved.

Zusammenfassung

Eagle und Wakefield (2007) verweisen auf Gemeinsamkeiten zwischen der klassischen „Isomorpismus"-These von Koffka und Köhler (der zufolge es grundlegende Parallelen von mentalen und Hirnprozessen gibt) und der neueren „embodied simulation"-Theorie von Gallese und Rizolatti. In Fortführung dieser Überlegungen konzentriere ich mich auf die behauptete Fähigkeit beider Theorien, zur Möglichkeit einer „direkten Wahrnehmung" der mentalen Erlebnisse anderer Personen Erhellendes beizutragen. Tatsächlich stecken in beiden Theorien fruchtbare Ansätze diese Möglichkeit plausibel erscheinen lassen, doch bleiben auch noch wichtige Probleme zu lösen.

References

Eagle, M.N., & Wakefield, J.C. (2007): Gestalt psychology and the mirror neuron discovery. *Gestalt Theory 29*, 59-649.

Eigen, M. (1971): Selforganization of Matter and the Evolution of Biological Macromolecules. *Die Naturwissenschaften 58* (10), 465-528.

Gallese, V. (2003a): The manifold nature of interpersonal relations: the quest for a common mechanism. *Philosophical Transactions of the Royal Society of London B 358*, 517-528.

Gallese, V. (2003b): The roots of empathy: The shared manifold hypothesis and the neural basis of intersubjectivity. *Psychopathology 36,* 171-180.

Gallese, V., Fadiga, L., Fagassi, L., & Rizolatti, G. (1996): Action recognition in the premotor cortex. *Brain 119*, 593-609.

Gallese, V. & Goldman, A. (1998): Mirror neurons and the simulation theory of mind reading. *Trends in Cognitive Sciences 12* (2), 439-501.

Gallese, V. & Metzinger, T. (2003): Motor ontology: the representational reality of goals, actions and selves. *Philosophical Psychology 16* (3), 365-388.

Holodynski, M. (2004): The miniaturization of expression in the development of emotional self-regulation. *Developmental Psychology 40* (1), 16-28.

Holodynski, M. & Friedlmeier, W. (2006): *Emotionen-Entwicklung und Regulation*. Heidelberg: Springer.

Koffka, K. (1924): *Growth of the Mind*. New York: Harcourt, Brace & Co.

Koffka, K. (1935): *Principles of Gestalt Psychology*. New York: Harcourt, Brace & Co.

Köhler, W. (1924): *Die physischen Gestalten in Ruhe und im stationären Zustand. Eine naturphilosophische Untersuchung.* Erlangen: Verlag der Philosophischen Akademie.

Köhler, W. (1947): *Gestalt Psychology. An Introduction to New Concepts in Modern Psychology.* New York: Liveright.

Levinás, E. (1987): *Totalität und Unendlichkeit. Versuch über die Exteriorität.* Freiburg: Alber.

Luchins, A.S., & Luchins, E.H. (1999): Isomorphism in Gestalt Theory: comparison of Wertheimer's and Köhler's concepts. *Gestalt Theory 21* (3), 208-234.

Mayr, E. (1979): *Evolution und die Vielfalt des Lebens*. Berlin: Springer.

Metzinger, T. (2003): *Being No One: The Self Model Theory of Subjectivity*. Cambridge MA: MIT Press.

Rizolatti, G., Fadiga, L., Matelli, M., Bettinardi, V., Parani, E. & Fazio, F. (1996): Localization of grasp representations in humans by PET: I. Observation versus execution. *Experimental Brain Research 111*, 246-252.

Rizolatti, G., Fogassi, L., & Gallese, V. (2001): Neurophysiological mechanisms underlying the understanding and imitation of action. *Nature Reviews in Neuroscience 2*, 661-670.

Rizolatti, G., Fogassi, L., & Gallese, V. (2002): Motor and cognitive functions of the ventral premotor cortex. *Current Opinion in Neurobiology 12*, 149-154.

Rizolatti, G., & Gallese, V. (2006): Do perception and action result from different brain circuits? The three visual systems hypothesis. In J.L. Van Hemmen & T.J. Sejnowski, *23 Problems in System Neuroscience*, 367-393. Oxford, New York: Oxford University Press.

Sebanz, N., Bekkering, H., & Knoblich, G. (2006): Joint action: bodies and minds moving together. *Trends in Cognitive Science 10* (2), 70-76.

Address of the Author:

Dr. Franz Mechsner

School of Psychology and Sport Science,

Northumbria University,

Northumberland Building

Newcastle upon Tyne

NE1 8ST

United Kingdom

Email: franz.mechsner@unn.ac.uk