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Embodied Simulation and the
Coding-Problem of Simulation Theory.
Interventions from Cultural Sciences

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Embodied Simulation and the Coding-Problem of Simulation Theory. Interventions from Cultural Sciences

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Prologue

I would like to start off my cultural-historical intervention with a trouvaille from the *Denktagebuch*, a sort of intellectual notebook, of Hannah Arendt, the famous German-Jewish philosopher (1906–1975). Arendt’s publications include a most profound book on the *Human Condition* (1958, in German *Vita activa*, 1960) in which she develops the idea of *acting/Handlung* as the crucial realm of intersubjectivity and humanity. This realm is based in the space between human beings, a literal *inter-est* of togetherness. It is only in this space, only in the relationship to others, that the full sense of the Self, including the involuntary expressions of the person, manifests itself. It is the same realm in which the moral, social and political life is created.

In the notebook of the 44-year-old Arendt one comes across the following entry:



Hannah Arendt (1906–1975)

Nothing reveals more of the ambiguity of language than the metaphor. I, for example, have been using the metaphor ‘I open my heart’ my whole life, without ever having felt the actual physical sensation. Only once I’ve experienced this physical sensation, I realised how often I had lied in the past. Yet, how could I have experienced the fundamental truth of this physical sensation, had not language prepared me with its metaphor for the significance of the event?

[»In nichts offenbart sich die eigentümliche Vieldeutigkeit der Sprache [...] deutlicher als in der Metapher. So

habe ich zum Beispiel ein Leben lang die Metapher ›es öffnet sich mir das Herz‹ benutzt, ohne je die dazu gehörende physische Sensation erfahren zu haben. Erst seit ich die physische Sensation kenne, weiss ich, wie oft ich gelogen habe [...]. Wie aber hätte ich je die Wahrheit der physischen Sensation erfahren, wenn die Sprache mit ihrer Metapher mir nicht bereits eine Ahnung von der Bedeutsamkeit des Vorgangs gegeben hätte?«]

(Notebook II, 22 December 1950, Arendt 2002, 46)

The entry discusses the mutual transferral between mind and body by reflecting the role of language as a mediator for minding the body and the embodiment of the mind. Since the phrase of the ‘open

heart' belongs to a register of long-established metaphors, these reflections concern the comprehension of body-metaphors and their role for a *shared meaningful space of experiences* (Gallese 2009a, 527), i.e. language as transmitter of experiences and memory in cultural history.

1. Introduction: Point of departure and field of intervention

Let me begin by explaining my point of departure and the field from which my intervention is coming in order to suggest a contribution to the fascinating dialogue between neuroscience and psychoanalysis.

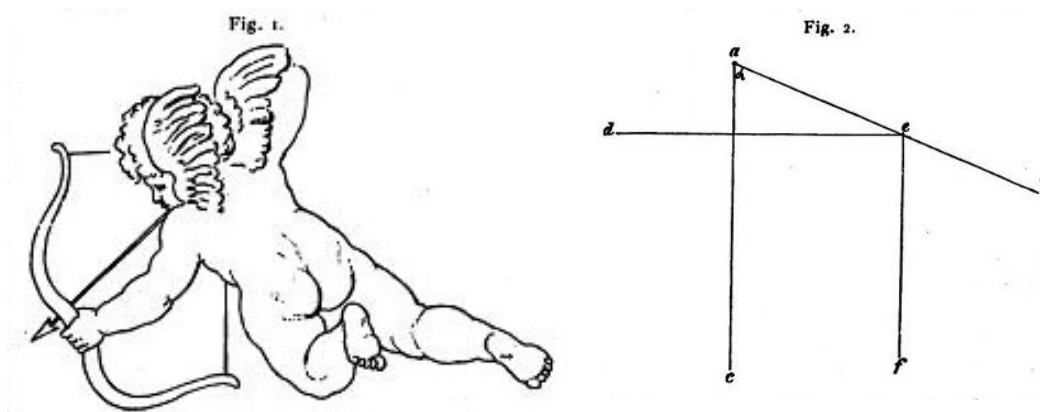
- a) My point of departure as regards *neurosciences* is the rising interest in *mirror mechanism, mimetic functions, imitation, simulation, embodiment, language and metaphors*—all of which emerged after, and in consequence of the discovery of MNS (*Mirror Neuron System*). For an academic like me, coming from the fields of philology and *Kulturwissenschaften*, best translated perhaps as cultural sciences, this whole register of concepts sounds quite familiar. Research in the history of culture has always been based in the conviction of a *close connection between mind, imitation, gestures and acting*. Therefore I appreciate that, through the discovery of the mirror neurons and the following emphasis on simulation theory, enactive mind, human semantics, gestural language, symbolic thought, and metaphors (Fonagy/Target 2007), a new approach has been developed. Through the discussion of figures like embodied simulation, shared interpersonal space, intercorporeity and empathy (Gallese 2009), the epistemology of neuroscience has overcome the long-lasting *underestimation of imitation*, which has been underpinned by a notion of the relation between brain activity and motoric acting that has long been too mechanistic.

Philology and cultural history are long-established fields of research occupied with detailed analysis of textual, oral, gestural, visual and other expressions, with well-thought out theories of mimesis, imitation, imagination, perception and deciphering. Therefore, I guess, it is time for this field of knowledge to take part in the effort of bridging neurosciences and psychoanalysis.

In order to give an impression of the relevance of this field one should remember the German concept of *Geisteswissenschaft* for humanities which literally means 'mind-science'. One could also think about one of the central ideas of literary theory, namely imagination (in German *Einbildung*), a concept which includes the word 'image' (*Bild*) and literally means an incorporation of an image (of an outer event, object, piece of art) into the mind, in other words: embodied perception. And in order to get an idea of the history of knowledge on imitation and embodied simulation one could initially think of just three *classical references* from cultural sciences: (1) Aristotle's idea of man as ζῷον μιμητικώτατον; (2) the 18th-century concept of *Bildung*, i.e. the idea that the development of a person is triggered by the inscription of images (an ontogenetic concept of epigenesis), when the shape of an antique sculpture gets embodied and inscribed into the mind or soul as a *signature* or trace, as Karl Philip Moritz explained in his *Signature of Beauty* and in his reflections on the "bildende" mimesis of beauty (Moritz 1968); (3) the concept of *pathosformula*, sometimes also called *dynamogram*, developed around 1900 by the German-Jewish art historian A. Warburg, the founder of the K.B.W. (Kulturwissenschaftliche Bibliothek Warburg), described as a kinetic image or image of bodily movements, and interpreted as a mediator for the expression of emotion between persons, spaces and times.

b) My point of departure as regards *psychoanalysis* is the fact that philology can look back at a long-existing, stable and fruitful relationship to psychoanalysis because the writings of Sigmund Freud, albeit without their clinical and therapeutic dimensions, belong to the body of knowledge in cultural sciences. Thus, Freud's work can be read as a theory of subjective and cultural meaning providing figures, explanations and laws for their genesis. During the long period in which psychoanalysis has had no academic home in universities (at least in German universities and in many other countries), it survived as a theory partly because many of Freud's texts were integrated into the curricula of several departments of literature and of cultural science.

I would also like to explain what I mean by *cultural sciences* (*Kulturwissenschaft*), not to be mistaken as Cultural Studies. Whereas the latter is mainly occupied with questions of class, race and gender and with interpretations of popular or mass media culture, *Kulturwissenschaft* is concerned with conceptual, visual, and epistemological issues of the history of knowledge and culture. It goes back to an intellectual undertaking around 1900 dedicated to the aim of developing an approach beyond the divide of the 'two cultures' of science and humanities. Concerned with the *cultural production of meaning*, this theoretical venture emerged from the attempt—in great parts disillusioned—to deal with empirical methods and approaches to analyse cultural phenomena borrowed from the natural sciences;¹ it was, at the same time, based on a critique of the metaphysical concept of 'Geist' in the establishment of *Geisteswissenschaft* (by Wilhelm Dilthey). The venture of *Kulturwissenschaft* was instead occupied with analysing the material culture, i.e. practical, symbolic and corporeal modes of expressing emotions and meaning, and thus interested in embodied and enacted modes of all sorts of human articulations. Aby Warburg, Sigmund Freud, Georg Simmel, Walter Benjamin, and Helmuth Plessner belong to this project, to name just a few authors.—This means that Freud is both, a fundamental theoretical source for *Kulturwissenschaft* and an object and body of ideas to be studied. In this context I am especially concerned with the complex relationship between the neurological precondition and the grounding of psychoanalysis as well as with the psychoanalytical modes of deciphering psychic procedures and their meanings.²



Sigmund Exner: *Die Physiologie des Fliegens und Schwebens in den Künsten* (1882)

1 An interesting example is the attempt of Sigmund Exner (1846–1926) from the Physiological Institute Franz Brücke in Vienna to measure the probable weight of flying objects (like angels and other heavenly figures) on paintings, and after having realised that he can't come to a reasonable result in that way, his decision to change the approach and instead to deal with memory images (Weigel 2007).

2 This relationship is at the core of a research-project at the ZfL-project on Freud and Neuroscience (www.zfl-berlin.org). See also my analysis of Freud's references to the biological knowledge of his time in the conceptualisation of drive (Trieb) in *Beyond the Pleasure Principle* (Weigel 2012).

2) Epistemological problems part I: the quantity-quality-gap

The attempts from the above-mentioned authors around 1900 are, in my eyes, of acute contemporary interest because they correspond with the current constellation in neuro-psychoanalysis, mainly with the still-existent hyphen. Both fields and epistemologies are involved in the ambitious project of bridging neurosciences and psychoanalysis. The epistemological situation of current research in the neurosciences is structured by an advanced *technology* (of brain imaging etc.) and highly differentiated *experimental studies* with fascinating empirical findings on the one hand, and an interpretative approach based on the *construction* of models (of the self, the brain-body-relation etc.) on the other. The problem of dealing with visualisations of the brain and of empirical findings as well as iconic models and constructions of inaccessible physiological regions can be observed in nearly every scientific presentation where the differences are being levelled out in the images. Since visual presentations do not distinguish between neurological “facts”, i.e. the visualisation of measured neurological activities, and graphic models, the *images in neuroscientific papers* are symptoms of encapsulated unsolved problems (Weigel 2004).

Despite the incomparable technological tools providing the possibility to literally “look into the brain”, the epistemological structure of current neuroscience is comparable to the dual trait Sigmund Freud had to deal with when he developed his metapsychology. The recent model of the self—for example the distinction between protoself, core self and autobiographical self (Damasio 2010)—has, in epistemological terms, the same constructive character as Freud’s models of the psychic apparatus. However, in contrast to Freud’s regular epistemological reflexions and repeated discussions of his speculations and assumptions, the constructive character of today’s neuroscientific models, a sort of metacognition, gets, for the most part, lost in descriptions of the brain and its anatomical and neuronal parts and functions.

Yet one of the gravest problems in the neurosciences today is not far from the theoretical problems Freud so lucidly discussed in his *Entwurf einer Psychologie* (1895), namely the gap between *quantitative-empirical methods* and the *question of quality resp. meaning*. In this unfinished and posthumously published manuscript he reflects the incompatibility between the “quantitative problem” or “biological position” (neurons as material/ physiological bearer of psychic processes), and the “problem of quality” (meaning). In the introduction of the *Entwurf* he expresses his intention to present a psychology based on natural sciences (*eine naturwissenschaftliche Psychologie*):

The intention is to furnish a psychology that shall be a natural science: that is, to represent psychical processes as quantitatively determinate states of specifiable material particles, thus making those processes perspicuous and free from contradiction. Two principal ideas are involved:

1. *What distinguishes activity from rest is to be regarded as Q, subject to the general laws of motion.*
2. *The neurons are to be taken as the material particles.* (Freud SE 1966, 295)

This methodological assumption strikingly resembles the *current neuroscientific approach*, namely in the difference between repose and activity as the fundamental entity of all brain scanning and mind mapping methods.

In his chapter on the “problem of quality”, Freud reflects that the inquiry into the *content* confronts us with totally different problems. He argues that what we know about the content or meaning of the quantities we only know from our consciousness. We get from it

what are called qualities—Sensations which are different in a great multiplicity of ways and whose difference is distinguished according to its relations with the external world. Within this difference

there are series, similarities and so on, but there are in fact no quantities in it. It may be asked how qualities originate and where qualities originate. (Freud SE 1966, 308)

And his following remarks that these are questions which need a thorough examination, belong to those demands which are still valid today.

In his later work, i.e. after the invention of psychoanalysis, when he was mainly dealing with corporeal and linguistic symptoms of meaning, *the economic principle* within the metapsychological triad (dynamic, topic, economic)—namely his references to a higher or lower level of energy or drive and to *intensity* or magnitude of arousal or excitation—functioned as a proxy for quantity within a qualitative approach. Whereas Freud's research went from neurology to psychoanalysis, the current constellation is organised the other way round, since the neuroscientific discourse has returned to Freud and psychoanalysis during the last decade. Therefore the crucial epistemological problem may also be identified in a reverse way:

What are the proxies for qualities in a dominantly quantitative approach?

In contemporary research these are mainly correlated indicators, examined by experimental activities of test persons, by observation and the reports of the probands. But in order to combine these correlative indicators with the findings of the brain scan one has to isolate them from the individual, social and cultural context, transfer them into algorithms and define or fix their meaning. In order to assimilate the qualities as far as possible to quantitative methods, one has to reduce the complexity of meaning by isolating single indicators and measurable entities. The definition of entities which function as proxies for quality or meaning recently tends to deal with mainly two terms: *map* and *code*.

Whereas *mapping* is a spatial figure of knowledge related to anatomical evidences in order to identify patterns of neurological activities (e.g. Bud Craig's "global emotional movement" defined as a map of energy representation, Craig 2011), the *code* stems from linguistic or semiotic knowledge and has been introduced into the life sciences decades ago, and the metaphorical state of the term has now been forgotten (Weigel 2006). In neuroscience it is presently used as a mediator between neurological facts and the meaning of feelings and memory. Due to the increasing relevance of MNS, simulation theory, and embodied intersubjectivity, language and meaning have entered the core of neuroscientific research. As a result the crucial epistemological problem has shifted from the quantity-quality gap to the *coding problem*.

3. *Epistemological problems part II: The coding term in simulation theory*

When discussing language, metaphors and semantics involved in the mirror function of embodied simulation, the current neuroscientific discourse regularly refers to the concept of code and coding. I mention just a few examples:

The idea of a "vocabulary of acting" in the mirror neuron book by Rizzolatti/Sinigaglia *So quel que fai. Il cervello che agisce e i neuroni specchio* (2006) constructs the movements involved in MNS as a sort of lexicon, i.e. a body of words with a conventional meaning. Vittorio Gallese conceives the MNS as a sort of coding system when for example talking of "brain areas that preferentially code for esthetic stimuli" (Gallese/Di Dio 2011, 6) or when talking of the mirror neurons coding the other's actions' meaning (Gallese 2009a, 521). Peter Fonagy and Mary Target, in contrast, discuss a "dual coding of language" and distinguish the "dictionary meaning of a word" from a second meaning; but they conceive also the latter as a code, and this on two different levels, the subjective and the evolutionary: On the subjective level, i.e. a "human semantics that map a person's cumulative experience", it is defined

as “sense, as opposed to meaning, that is embodied and encoded through experiences of the physical body” (ref. Klin/Jones). On the evolutionary level it is seen as a “second, embodied, physical-experience-based coding system built into language by its evolutionary history” (I. Fónagy) going back to gestures (Fonagy/Target 2007). In this way MNS, simulation theory and its IIF (Interpersonal Interpretative Function) get conceptualised as an *encoding-decoding-system*.

This coding paradigm is based on the fact that the reference to language theory within the neuroscientific research community is, so far, mainly informed by *linguistics* which, seen from the perspective of the history of humanities, is quite a young discipline. Within linguistics the coding-model refers especially to speech act theory or formal linguistics underpinned by mathematics, cognitive or analytical philosophy. In contrast, the understanding of language in cultural science is different and more related to continental philosophy. At this point, an excursus to language theory can not be avoided.

It is rare to come across linguistic theories open to expressions beyond verbal language, signs and code. Such a rare exception is, for example, the approach to gestures in Ivan Fónagy’s theory of language to which Fonagy/Target 2007 refer. *Linguistics*, regardless which camp of the “linguistic war” (Chomsky–Lakoff), conceives language as a *system of rules*, generating sentences and announcements. It mainly refers to the spoken language and conceptualises other modes of expression like verbal language. An *Encoding-decoding-system*, in the strict sense of the words, comes from *information theory* (resp. communication theory); it is construed as a one-to-one-model in which language is seen as an arbitrary, conventional system. The coding of the sender and the decoding by the receiver are constructed as complementary actions whereby occurring differences between the encoded and decoded message can only be described in terms of *disturbance* or failure.

When studying the recent papers on simulation theory, I found one idea especially irritating, that is Lakoff’s idea of a “conceptual metaphor”. The reason is that the idea of *metaphor* (from gr. μεταφορά, transfer, literal carry from one point to another) only emerges when it becomes distinguished from direct designation or denotation, i.e. from a *conceptual term* (*Begriff*). Seen from a *longue durée*-perspective of cultural history, one has to add that the separation between metaphors and concepts has been preceded by a sort of imagistic consciousness, i.e. in thinking before and below the separation of direct and metaphorical expression. Thinking in images is the beginning and foundation of language.

The metaphor belongs to the traditional key concepts of humanities, so that there exist numerous works on metaphors providing detailed analyses particularly on distinctions between different kinds and fields of metaphorical thought. In his ongoing research on the history and theory of metaphors, Hans Blumenberg (1920–1996), for example, starting with his *Paradigms of a Metaphorology* (1960), has broadly examined this realm of what he calls unconceptual thinking. His work was dedicated to differentiating different fields, qualities and functions of metaphors. Among other things he analysed a field of *Daseinsmetaphern* (metaphors of being), i.e. figures which structure a whole field of experience (his famous example is the shipwreck, Blumenberg 1979). Although this field might be compared to Lakoff’s ‘conceptual metaphors’, these linguistic images are in the light of Blumenberg’s theory not to be seen as universal; instead their generation depends on fundamental experiences in different cultures (land, sea, agriculture, industrial, rural areas, cities etc.). Quite different is another field of *absolute metaphors*, i.e. metaphors which cannot (yet) be translated into concepts. The latter are often used in science; and they are particularly useful for fields not yet fully conceived, and for inner, invisible or in other ways inaccessible fields of knowledge. Needless to say that the mind belongs to this field (Blumenberg 2007). And Blumenberg was one of the first scholars from the humanities to present an enlightening analysis of the emergence of the ‘genetic code’ (Blumenberg 1979).



Hans Blumenberg

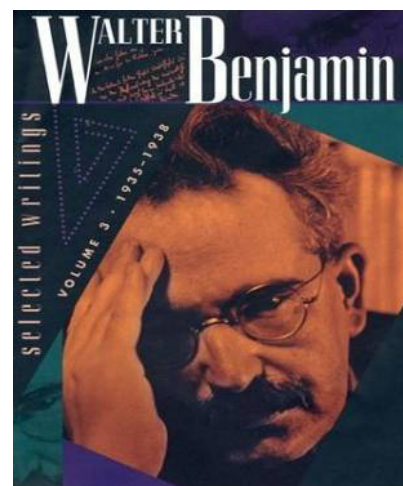


Georg Lakoff

In comparison to Blumenberg's theory, Lakoff's 'conceptual metaphor' is constructed as a more or less universal phenomenon. He considers metaphors as being an "unconscious symbolic thought," and as a "natural mechanism for relating concrete images to abstract meanings" (Lakoff 1997). Although his examples are taken from modern every day life and ordinary language, the construction of such a realm of quasi-natural metaphors has a lot in common with C. G.

Jung's idea of the archetype. Since Lakoff discusses the conceptual metaphor in relation to his model of a 'cognitive unconscious', this idea seems at first glance to be of interest in the current dialogue between neuroscience and psychoanalysis. However, what he calls 'unconscious' when discussing the function of metaphors in "the normal mind" (Lakoff 1997, 90) and defining it as a sort of "fast, automatic, effortless—and completely normal" thinking, is quite different from the unconscious in psychoanalysis. Especially as regards the 'return to Freud' in neuroscience, one has to take care to work with terms that are as precise as possible. What kind of different phenomena have not been called *unconscious* in recent scholarship! But terminology counts! Since Freud's terminology of *conscious*, *unconscious*, and *preconscious* provides a central terminology of psychoanalysis, it makes no sense to use the same terms indiscriminately for other phenomena. We need clear, distinct and differentiated terms for what is *not conscious*, for example whether being seen as preconscious, unconscious, a-conscious, involuntary, automatic, reflexive, etc. The small prefixes to supplement the conscious in this field of terminology produce a difference of all or nothing,—as George-Arthur Goldschmidt has shown in his readings of English and French translations of Freud's writings (Goldschmidt 2000).

The mode of metaphorical expression Lakoff describes as fast, automatic, effortless has been analysed in cultural sciences as a broad field of *involuntary* expression and acting. It concerns conventional meanings which are acquired not through an organised procedure of learning but instead through a sort of *habituation*—or to put it in the terms of simulation theory—as a visio-acoustic-motoric embodiment. This takes place as a kind of involuntary acculturation, and the particular meanings depend on the specific historical and cultural environment which coins the source domain of the metaphorical operation. The whole field of involuntary thought and acting gets, for example, changed to a great extent by the development of technology, instruments, and machines invading everyday life. As Walter Benjamin has discussed in his history of European modernity (*Arcades-project*), the field of involuntary motoric movements has been extended enormously already during the 19th century when life was equipped with more and more instruments (Benjamin 2002).



But, instead of criticising the language theory of linguistics any further I would like to suggest another approach to *language*, i.e. *language in the broader sense*, namely including all sorts of textual, oral, visual, gestural, bodily and other expressions of affects and meaning.

4. *Mimetic and arbitrary aspects of language—the time of cultural history*

With this I am turning towards a crucial question of simulation theory: For this the connection between visual and motor functions is of fundamental importance because perceiving actions of others activates motor activities.

In his article on *Mirror Neurons, Embodied Simulation and the Neural Basis of Social Identification*, Gallese poses the vitally important question “how the MNS develops in the course of development” (Gallese 2009a, 529). In order to find an answer he discusses findings from experimental research on kinematic patterns during prenatal development in neonates and infants,—thus dealing with the *ontogenetic dimension* as the only developmental dimension accessible to empirical research. In this context he presents a study by Shimada/Hiraki (2006) demonstrating “an action execution / observation matching system in 6-month-old human infants”, and reports the findings as follows: “Interestingly, this study showed that the sensory-motor cortex of infants (but not that of adult participants) was also activated during the observation of a moving object when presented on a TV screen. These findings suggest that during the early developmental stages, even nonbiological moving objects are ‘anthropomorphized’ by means of their mapping onto motor representations pertinent to the observers’ acquired motor skills” (530). Gallese summarizes these findings in the hypothesis that there exists an innate rudimentary MNS which is already present at birth and can be flexibly modulated by motor experience and gradually enriched by *visuomotor learning*.

What immediately attracted my attention when reading this passage was the anthropomorphism in the infants’ reception of objects. I would interpret this as an early stage of simulation which is based in a formerly existing mimetic culture. It reminds me of a beautiful piece in Walter Benjamin’s autobiographic book *Berlin Childhood around 1900* (written 1933ff.), consisting not of a developmental narrative but of a series of short scenarios or thought images. In a piece entitled *Butterfly Hunt* he describes the young boy’s movements when pursuing the butterflies: his mimetic movements in following the movements of the fluttering butterfly as well as the echoes of an inner fluttering elicited by his bodily movements: “the more I strove to conform, in all the fibers of my being, to the animal—the more butterfly-like I became in my heart and soul” (Benjamin 2002, 351). There are other passages in this book in which he describes a similar attitude towards the non-living environment, thus presenting a fundamental mimetic faculty in infants condensed in the statement “I was distorted by similitude with everything which was surrounding me” (*The Mummerehlen*, Benjamin 2002, 374). He also shows how this attitude gets refrained, subjected and overlapped by learning conventions and codes, both of language and acting, as well as learning to distinguish between living beings and the anorganic world. This refraining of mimetic acting anticipates the findings of another empirical study, cited by Gallese, i.e. that “Lepage/Théoret (2007) recently proposed that the development of the MNS can be conceptualized as a process whereby the child learns to refrain from acting out the automatic mapping mechanism linking action perception and execution” (Gallese 2009a, 530). Whereas psychoanalysis describes social learning as the inhibition of desires and drives, one may add that, as regards language, this ontogenetic process is accompanied by an inhibition of mimetic modes of expression within the social and symbolic language.

What a *cultural historical approach* has to offer to this topic is the invention of a *third time dimension* providing a supplement to the two perspectives of phylogenetic/evolutionary and ontogenetic development. Concerning the hypothesis of an innate rudimentary MNS which provides the person with a neuronal-based capacity of empathy and embodied simulation, neuro-psychoanalysis refers to: a) *ontogenetic development*: through observation and empirical research, clinical and analytical experience, and b) *phylogenetic development*: in the mode of *speculation*, namely by taking the existing physiological features and capacities as a point of departure for a projection of its generation back into the time of evolution. For example:

Fónagy speculates that at a certain point of evolution (probably more recently than previously thought) mental states came to be expressed by means of vocal mimetics—laryngeal and oral—and their audible products: tonal movements and sound-images. Some clear traces of this remain ‘fossilized’ in language development. (Fónagy/Target 2007, 434)

This assumption coincides with the broader image of human development in contemporary anthropology. In his book *Cultural Origins of Human Cognition* (1999) Michael Tomasello, for example, proceeds on the assumption that the “cumulative cultural evolution depends on two processes, innovation and imitation (possibly supplemented by teaching), which must take place over time such that one step in the process enables the next” (39). He regards the capacity of men to perceive the other as an intentional being, similar to themselves, as a biological heritage of homo sapiens, whereas the cognitive and cultural faculties—he talks on language, symbolic representation, gestures, and cognitive achievements like mathematics—are understood as a product of learning adopted during the ontogenetic development. And it is only the latter which in his book gets discussed according to findings from widespread empirical research.

The gap between the *time of evolution* (as an object of speculation) and the *time of ontogenetic development* (as an object of empirical studies) can be bridged by the *time of cultural history*. The latter is the very time during which the production of cultural and social meaning takes place; and it is accessible for research as the object of philological and archaeological examinations: studying the remains, traces and symptoms of former and other cultures.

TIME OF EVOLUTION

Phylogenetic development

SPECULATION

projecting back into pre-history

TIME OF CULTURAL HISTORY

Production of cultural meaning

» » PHILOLOGY AND ARCHAEOLOGY

examination of remains, traces and symptoms

TIME OF ONTOGENESIS

of former/other cultures

Individual development

OBSERVATION

empirical research

clinical and analytical experiences

Coming back to the *coding-problem*, the invention of this third epistemological time perspective is of great importance; it is the period of the formation and shaping of a specific human culture. Concerning the *history of the coding problem*, Walter Benjamin in an essay from 1916 develops an interesting dialectic language theory. His reflections depart from the irreconcilable opposition between then existing language theories—on the one hand the idea of similitude between nature/ things and words (“mystical theory of language”) and on the other hand the idea of an arbitrary language (“bourgeois theory of language”)—in order to transform this opposition into a historical dialectic, arguing that a former mimetic language has, in the course of the historical development, got subjected and replaced by a language which functions as a system of signs (Benjamin 1996). In a later essay on the *Mimetic Faculty* (1933) he developed this idea further in stating that this later developed semiotic system of language (i.e. a system of conventional signs) does not only function as a means of communication but simultaneously also as a bearer or medium of mimetic elements in language, however, the latter appearing only in specific moments or fragmented forms. In his explanation he reflects the history of mimetic faculty and—by referring to different phenomena from childhood as well as former archaic cultures with a mimetic attitude in relation to nature and the outer world (cult, astrology, dance, macro-micro-cosmos-models, et al.)—states that the gift to perceive similarities is “nothing than the formerly tremendous constraint, to become and to behave similar”, i.e. to act according to a mimetic principle. His conclusion reads like this:

In this way, language may be seen as the highest level of mimetic behaviour and the most complete archive of nonsensuous similarity: a medium into which the earlier powers of mimetic production and comprehension have passed without residue, to the point where they have liquidated those of magic. (Benjamin 1999a, 722; [recte mine, S.W.]

By unsensual similitudes he does not mean similitudes which are not conceivable with the senses; he refers to a sort of similitude that needs not to be visually or audibly conceivable because a transferral between the sensual and the mind is involved in the operation of similarity. —Benjamin’s interpretation that an overlapping of a mimetic system of meaning by a conventional (arbitrary) knowledge and language and an integration of the former into the latter has taken place during the time of cultural history has been confirmed by many studies. For example Michel Foucault shows in his history of knowledge *Les Mots et les Choses. Une archéologie des sciences humaines* (1966) how a system of similitude (con-

venientia, aemulatio, analogia, sympathia) dominating meaning in pre-modern times (one of his main examples is Paracelsus’ macro-micro cosmos) has been replaced by a normative, universally valid language system (lexicon, grammar, orthography) only during the 17th century. The result and indicator of this process is the *Grammaire générale et raisonnée* of Port Royal (1662). Whereas this date counts foremost in French culture, the view of language history is valid also for other cultures, at least for the European cultural history.



Paracelsus (1493–1541)



5. Language, image, gesture

Kulturwissenschaft has not only to offer the perspective of historical time as an additional field of investigation to bridge the gap between evolution and ontogenesis. It also has a large body of knowledge on a differentiated register of expressions at its disposal, which should be interesting for simulation theory. As regards the relevance of an *imitation mechanism* in MNS and *simulation theory* it might be of specific interest that all modes of language within a cultural historical approach are based in an *imagistic notion of language*. This means that not only *similitude* is understood as preceding arbitrary meaning, but that images (in the broader sense, i.e. not only visual images) are conceived as preceding words, or, more precisely, the separation of image and word is but a product of history; in Europe this separation became prevalent only in early modern and modern times, in connection with a conventional system of codes and signs. To present just two definitions of this idea of image, I quote Benjamin's definition from the 1930s and that of W.J.T. Mitchell from the 1980th:

[...] *image is that wherein what has been comes together in a flash with the now to form a constellation.* (*The Arcades Project*, Benjamin 1999a, 463, N3,1)

The image is the general notion, ramified in various specific similitudes (convenientia, aemulatio, analogy, sympathy) that holds the world together with 'figures of knowledge.' (Mitchell 1986, 11)

This theory of image is based on a *material notion of culture*, namely analysing the interplay between different bearers and mediators of meaning (bodily enacted, textual, visually reproduced etc).

In general, philology and *Kulturwissenschaft* can be described as a field of analysing:

- the *production of knowledge and meaning* including both a historical and a personal perspective,
- the *modes of relating*: mimesis, imitation, fiction (from lat. *fictio, fingere*), imagination
- the *figurative language*, i.e. tropes, schemata (from gr. *σχῆμα*), images (in the broader sense), metaphors, visual and verbal embodiments (allegories/personifications)
- the relationship between *denotation* (explicit, intentional meaning) and *connotation* (implicit or involuntary meaning, subtext),
- *kinetic and corporeal expressions*: gestures, expressions of emotion, pathosformula, *Gebärden* (from: *Gebaren*, behave).

It is therefore interested not only in codes and *rules of signification*, but also in all modes of *non-arbitrary meanings* (rhythm of breath, voice, intonation, silence) and also in the so-called language of the unconscious (dreams, symptoms, slips).

This whole register of expressions which is the object of Cultural Science can not be classified in that it gets separated in *arbitrary* and *non-arbitrary* parts. Instead, each particular meaning has to be deciphered in order to identify its conventional elements as well as the connected other part (be it subjected, supplemented, preceding or contradicting) and its quality (whether mimetic, based in similitude, involuntary or unconscious). This means that all expressions using codes or arbitrary meanings are imbued with other elements, often aspects of similitude or mimesis.

Needless to say that this approach has a lot in common with psychoanalysis—and, as I want to state, that it has more and more in common with *simulation theory* and the question of a *shared meaningful interpersonal space* (Gallese 2009a, 527).

6. Empathy and its relative from cultural science: Compassion

Within the discussion of simulation theory the idea of *empathy* as a neuron-based capacity plays a central role. In order to demonstrate what the particular relation between simulation theory and cultural history might look like, I would like to present one example from my own recent research. Discussing a certain chapter of cultural history during which the figure of *compassio* emerged, I want to point out in which way this figure both precedes and overlaps empathy.

My thesis is that *embodied simulation* has to be analysed as a *result of a cultural production and shaping of the human physiological prerequisite into a specific attitude of empathy which takes place by a visual-performative embodiment of meaning*.

- a) The first part of my thesis, the theoretical argument, is that within the *history of knowledge* the figure of *compassio* precedes empathy. —The age of *empathy*, as the canonical narrative of the term in neuroscience has it, reaches back to theories of empathy (*Einfühlung*) in German aesthetic theories around 1900 (Robert, Vischer, Lipps, Wilhelm Worringer). It is sometimes traced back to its so-called ‘forerunner’—*sympathy*—namely when the latter appeared in the 18th century in Adam Smith’s *Theory of Moral Sentiments* (1752). However, this covers only a rather short-term memory of the idea and concept. It has to be grounded in an actually much longer cultural history, starting with *empathia* and *sympatheia* in antiquity, being followed by its transformation and differentiated into Latin compassion, *commiseratio* and *miser cordia* and translated into French *commisération* and *pitié*, English *commiseration* and *pity*, while the German *Mitleid* is accompanied by *Barmherzigkeit*, *Erbarmen* and *Mitgefühl*.
- b) The second part of my thesis, the historical argument, concerns the *human capacity of empathy*. Here, the figure of compassion, in contrast, overlaps the physiological human prerequisite entitled empathy. —Whereas in simulation theory the MNS and the faculty of empathy is described, in qualitative respect, as a *neutral faculty*, it gets shaped in respect of quality via the process of embodied simulation and “visuomoto learning” (Gallese 2009a, 530) in that it gets charged with a moral and social meaning. But it is not only the case that there exist correspondences between phylogenesis and ontogenesis, there also exist correspondences between cultural history and the process of subjective acculturation. The particular qualitative sense of empathy, namely a concrete fellow feeling in relation to the other (compassion) is a result of a process of cultural production, i.e. the shaping of the figure in a shared meaningful interpersonal space mediated through visual, gestural, textual images and their embodiment. This means that the culturally produced figure plays a role within the process of the so called *coding* of embodied simulation. We have no understanding yet how the coding or the content formation of a specific feeling exactly functions within the MNS. But the history of culture provides a lot of sources for examining the cultural embodiment of *compassion*.

The figure of compassion has been shaped into a forceful embodiment of human attitude through a multiple site of production. Against the background of my research so far (which includes the history of compassion and empathy only in the European history) it can be said that *Compassio* was formed:

- as a fellow feeling of an empathic mimetic relationship to another (suffering) person,
- as a figure of social behaviour within a group or community
- and as an indicator for and embodiment of humanity.

Although Paul the apostle already wrote: “Be happy together with those who are happy and cry with those who are crying” (Ep. Rom. 12, 15), compassion—in the sense of an intersubjective attitude—did not emerge until medieval times, that is to say in an era when Christianity was transformed from a doctrine and ecclesiastical institution into a social culture, i.e. a pattern and norm for the living together in a community. It was within this context that *compassion* was formed through a multiple scenario of mimetic and embodied figures. To give just as short an impression as possible in this paper, I mention the most important sites in which the image and idea of compassion occurred.



A performative site was provided by the Easter or Passion plays (12th/ 13th cent.) with the invention of the motif ‘lament of Mary’



A vocal-musical site is the *Stabat mater* song (13th cent.) with the line “*Quis est homo qui non fleret*” and the musical formula of *plorant semiton* (weeping half-tone)



The visualisation can be seen in the paintings centred around the motif of the lamenting mother (the iconography of descent for the cross, Lamentation and pieta, 14th/ 15th cent.)

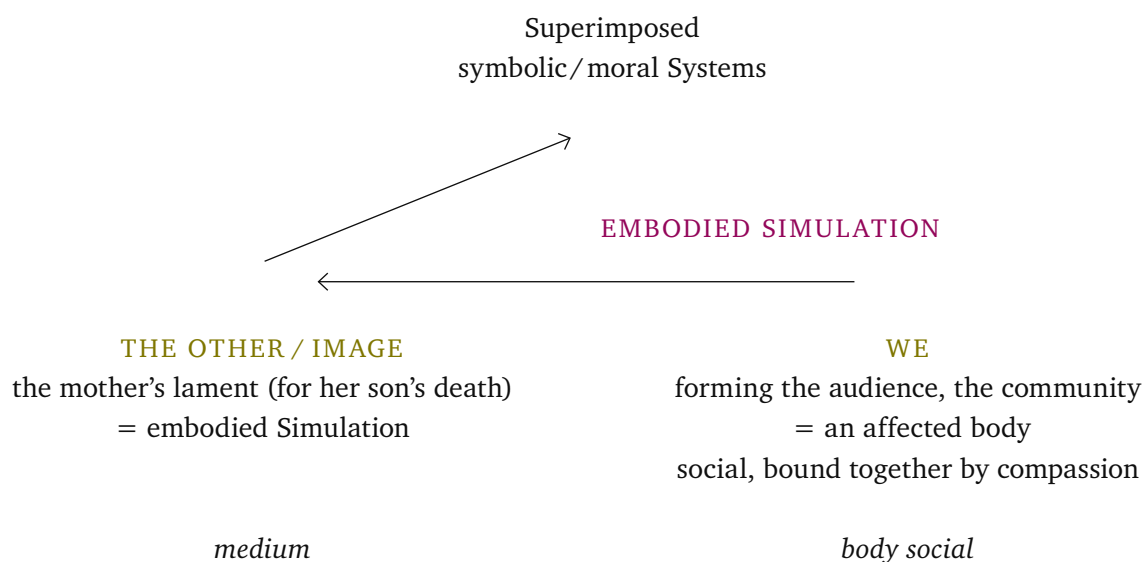
Rogier van der Weyden’s painting *Deposition* (around 1435/40) can be read as a condensed depiction of embodied simulation of *compassion*. This is obvious not only in the way the collapsing body of the mother resembles the shape of Christ’s corpse but also through the group of people surrounding this scene and weeping with Mary. The painting beautifully shows the shift from



the theological motif of *passio*—the suffering of a superhuman figure—to the cultural and social constellation of *compassio* as an intersubjective scene, a site of embodied simulation shaping the idea of compassion.

Rogier van der Weyden (1400–1464), *Deposition* (1435/40), centre piece of a triptych, painted for a church in Leuven, today in Prado (Madrid).

When *compassion* in this historical constellation emerges as a basic requisite not only for the individual but also for an intersubjective attitude and behaviour, and hence for the constitution of a community, this figure is a product of a constellation which combines (1) a mimetic intersubjective relationship, a *dual* constellation of intercorporeality (the perceiver in relation to Mary/the mother), and (2) a meaningful *space* in which Mary functions as a mediator to a higher moral meaning, thus forming a triadic constellation as a threshold and site of exchange between a dual corporeal relation to the other and an superimposed symbolic system. Since this constellation, namely the threshold between a dual and the triadic structure, resembles the basic, conflict-laden scenario in psychoanalysis, it is not only interesting for examining the relation between empathy and compassion, in other words between neuroscience and *Kulturwissenschaft*. The constellation also refers to controversies within the field of psychoanalysis based on the emphasis on different stages and situations within the development of a subject, whether on the relationship to the mother or other or on social patterns.



Thus I want to conclude with the suggestion that a broader and more differentiated, culturally informed reference to language in neuro-psychoanalysis could provide a means to close the still existing gap a little further.

References

- Arendt, H.** (2002): *Denktagebuch*. München/Zürich: Piper 2002.
- Benjamin, W.** (1996): On Language as Such and on the Language of Men. In: *Selected Writings*. Vol. 1. 1913–1926. Ed. by Marcus Bullock and Michael W. Jannings. Cambridge, Mass./London: Harvard Univ. Press, pp. 62–74.
- Benjamin, W.** (1999a): On the Mimetic Faculty. In: *Selected Writings*. Vol. 2. 1927–1934. Ed. by Michael W. Jennings, Howard Eiland and Gary Smith. Cambridge, Mass./London: Harvard Univ. Press, pp. 720–722.
- Benjamin, W.** (1999b): *Arcades Project*. Transl. by Howard Eiland and Kevin McLaughlin, Cambridge, Mass./London: Harvard Univ. Press.

- Benjamin, W.** (2002): *Berlin Childhood around 1900*. In: *Selected Writings*. Vol. 3. 1935–1938. Ed. by Michael W. Jennings and Howard Eiland. Cambridge, Mass./ London: Harvard Univ. Press, pp. 344–413.
- Blumenberg, H.** (1960): *Paradigmen zu einer Metaphorologie*. Bonn: Bouvier.
- Blumenberg, H.** (1979): *Schiffbruch mit Zuschauer. Paradigma einer Daseinsmetapher*. Frankfurt a.M.: Suhrkamp.
- Blumenberg, H.** (2007): *Theorie der Unbegrifflichkeit*. Frankfurt a.M.: Suhrkamp.
- Craig, B.** (2011): *How do you feel? The neuroanatomical basis for human awareness of feelings from the body*. Paper at the 12th International npsa-congress Berlin.
- Damasio, A.** (1999): *The Feeling of What Happens: Body and emotion in the making of consciousness*. London: William Heinemann.
- Damasio, A.** (2010): *Self Comes to Mind: Constructing the Conscious Brain*. New York: Pantheon Books.
- Dilthey, W.** (1990): *Einleitung in die Geisteswissenschaften. Versuch einer Grundlegung für das Studium der Gesellschaft und der Geschichte*. Göttingen: Vandenhoeck & Ruprecht.
- Fonagy, P./ Target, M.** (2007): The rooting of the mind in the body: New links between attachment theory and psychoanalytic thought. In: *Journal of the American Psychoanalytic Association* 55 (2), pp. 411–456.
- Fonagy, P./ Target, M.** (1996): Playing with reality: I. Theory of mind and the normal development of psychic reality. In: *International Journal of Psycho-Analysis* 77, pp. 217–233.
- Fonagy, P./ Gergely, G./ Jurist, E./ Target, M.** (2002): *Affect Regulation, Mentalization and the Development of the Self*. New York: Other Press.
- Foucault, M.** (1966): *Les Mots et les Choses. Une archéologie des sciences humaines*. Paris: Gallimard.
- Freud, S.** (1975a): Project for a Scientific psychology, Part I. In: *The standard edition of the complete psychological works of Sigmund Freud*. Vol. 1.: Pre-psycho-analytic publications and unpublished drafts. Transl. from the German a. ed. by James Strachey. London: Hogarth Press, pp. 295–346.
- Freud, S.** (1975b): The interpretation of dreams. In: *The standard edition of the complete psychological works of Sigmund Freud*. Vol. 4. Transl. from the German a. ed. by James Strachey. London: Hogarth Press.
- Freud, S.** (1975c): Instincts and their Vicissitudes. In: *The standard edition of the complete psychological works of Sigmund Freud*. Vol. 14.: On the history of the psycho-analytic movement. Papers on metapsychology and other works. Transl. from the German a. ed. by James Strachey. London: Hogarth Press, pp. 117–140.
- Freud, S.** (1975d): *Beyond the pleasure principle. Group psychology and other works*. In: *The standard edition of the complete psychological works of Sigmund Freud*. Vol. 18. Transl. from the German a. ed. by James Strachey. London: Hogarth Press.
- Goldschmidt, G.-A.** (2000): *Quand Freud voit la mer. Freud et la langue allemande*. Paris: Buchet / Chastel.
- Gallese, V.** (2009a): Mirror Neurons, Embodied Simulation, and the Neural Basis of Social Identification. In: *Psychoanalytic Dialogues* 19: 5, pp. 519–536.
- Gallese, V.** (2009b): We-ness, Embodied Simulation, and Psychoanalysis: Reply to Commentaries. In: *Psychoanalytic Dialogues* 19: 5, pp. 580–584.
- Gallese, V./ Di Dio, C.** (2011): Neuroesthetics: The Body of Esthetic Experience. In: *Encyclopedia of Human Behavior*. 2nd Edition. Ed. by Vilayanur Ramachandran. San Diego [u.a.]: Acad. Press.
- Gallese, V.** (2011): *Bodily Selves in Relation: Embodied Simulation and Intersubjectivity* (Paper at the npsa 2011).
- Kaplan-Solms, K./ Solms, M.** (2000): *Clinical Studies in Neuro-Psychoanalysis: Introduction to a Depth Neuropsychology*. New York: Karnac Books.
- Lakoff, G.** (1997): How unconscious metaphorical thought shapes dreams. In: *Cognitive Science and the Unconscious*. Ed. by Dan J. Stein. Washington 1997, pp. 89–120.
- Lakoff, G./ Johnson, M.** (1999): *Philosophy In The Flesh: the Embodied Mind and its Challenge to Western Thought*. New York, NY: Basic Books.
- Mitchell, W.J.T.** (1986): What is an Image? In: *Iconology – Image, Text, Ideology*. Chicago; London: The University of Chicago Press, pp. 7–46.
- Moritz, K.P.** (1968): *Über die bildende Nachahmung des Schönen*. Nachdr. d. Ausg. Stuttgart 1888. Nendeln/ Liechtenstein: Kraus.
- Panksepp, J.** (1998): *Affective Neuroscience: The Foundations of Human and Animal Emotions*. Oxford: Oxford University Press.
- Plessner, H.** (1965): *Die Stufen des Organischen und der Mensch. Einleitung in die philosophische Anthropologie*. Berlin: De Gruyter.

- Plessner, H.** (2003): *Anthropologie der Sinne*. Gesammelte Schriften in zehn Bänden, Bd. 3. Frankfurt a.M.: Suhrkamp.
- Rizzolatti, G./Sinigaglia, C.** (2008): *Empathie und Spiegelneurone: Die biologische Basis des Mitgefühls*. Frankfurt a.M.: Suhrkamp.
- Shimada, S./Hiraki, K.** (2006): Infant's brain responses to live and televised action. In: *Neuroimage* 32 (2), pp. 930–939.
- Simmel, G.** (1992): *Soziologie. Untersuchungen über die Formen der Vergesellschaftung*. Frankfurt a.M.: Suhrkamp.
- Solms, M./Saling, M.** (1986): On psychoanalysis and neuroscience: Freud's attitude to the localizationist tradition. In: *The International Journal of Psychoanalysis* 67, pp. 397–416.
- Solms, M.** (2000): Dreaming and REM sleep are controlled by different brain mechanisms. In: *Behavioral and Brain Sciences* 23, pp. 843–850.
- Solms, M.** (2001): The interpretation of dreams and the neurosciences. In: *Psychoanal. History* 3, pp. 79–91.
- Solms, M./Turnbull, O.** (2002): *The Brain and The Inner World: An Introduction to the Neuroscience of Subjective Experience*. New York: Other Press/ Karnac Books.
- Tomasello, M.** (1999): *Cultural Origins of Human Cognition*. Cambridge, Mass. [u.a.]: Harvard Univ. Press.
- Turnbull, O.H.** (2001): The neuropsychology that would have interested Freud most. In: *Neuro-Psychoanalysis* 3 (1), pp. 33–38.
- Warburg, A.** (2010): *Werke in einem Band*. Hg. u. komm. v. Martin Treml, Sigrid Weigel u. Perdita Ladwig. Berlin: Suhrkamp.
- Weigel, S.** (2006): Der Text der Genetik zwischen Metaphorik und Algorithmus. In: *Genea-Logik. Generation, Tradition und Evolution zwischen Kultur- und Naturwissenschaften*. München: Wilhelm Fink, S. 235–262.
- Weigel, S.** (2007): The Measurement of Angels. Images of pure Mind as a Matter of Science in 19th Century. In: *European Review*, Vol. 15, No. 3/2007, pp. 297–320.
- Weigel, S.** (2004): Phantombilder zwischen Messen und Deuten. Bilder von Hirn und Gesicht in den Instrumentarien empirischer Forschung von Psychologie und Neurowissenschaft. In: Bettina von Jagow / Florian Steger (Hg.): *Repräsentationen. Medizin und Ethik in Literatur und Kunst der Moderne*. Heidelberg: Winter, S.159–198.
- Weigel, S.** (2012): Jenseits des Todestrieb. Sigmund Freuds Lebenswissenschaft an der Schwelle von Natur- und Kulturwissenschaft. In: *Das Leben vom Tode her*. Hg. v. U. Vedder, K. Solhdju. München: Fink (forthcoming).