

Motion and Emotion

The application of sensory-motor concepts to the representation of emotion in literature

Wolfgang G. Müller
Friedrich-Schiller-Universität Jena
Philosophische Fakultät

womu@gmx.de

Abstract

This article attempts to relate to literature insights on the role of sensory and motor processes as essential constituents of cognition. It concentrates on the representation of emotion. The starting-point of the investigation is the fact that the representation of emotion in literature is – analogous to emotion in actual life – essentially constituted by motion and other physical or physiological manifestations. The investigation is supported by cognitive research and by neuroscientific research concerning the interdependence of emotion and motion. Evidence is adduced that emotional experiences are in a great quantity of literary texts represented as cognitive experiences with a strong participation of kinesthetic activities of the body.

Keywords: embodied cognition, emotion, motion, facial feedback, body metaphors

1 Introduction

Cognitive science has recently had such a strong impact on literary studies that one can speak of a cognitive revolution in the scholarly treatment of literature (Stockwell, 2002). The new concept of embodied cognition or grounded cognition, which accords the body a central role in shaping the mind (Wilson 2002, Barsalou: 2008, 2010), has, however, not yet found reverberations in literary studies. Embodied cognition is an extraordinarily wide concept. It means that the areas in the brain which activate the body and those which are involved in processing reason and linguistic meaning work interdependently. (Wilson, 2002, Mahon/Caramazza, 2008) In fact, an embodied theory of meaning seems to take shape which relates the meaning of words and sentences to bodily action. (See for instance Glenberg and Paschak, 2002)

The present article¹ is a new departure in that it attempts to relate to literature insights on the role of sensory and motor processes as essential constituents of cognition.

¹ I am indebted for valuable help and inspiration to my Jena colleagues Doreen Triebel, Dirk Vanderbeke and Oliver Bock. For whatever may be open to criticism in this study they are not responsible.

(Pezullo et al., 2011) The notion of sensory-motor processes is comprehensive, since it includes, on the one hand, gestural, facial aspects and other movements of the body, and, on the other hand, phenomena such as smelling, tasting and hearing. It is not always possible to treat these processes separately. The following contribution concentrates on emotion, which has been a quite prominent topic in cognitive studies for the last two decades. (Hogan, 2010, p. 237) It attempts to show that writers of fictional literature seem to have had a notion of embodied cognition long before the term was created. A basis for applying sensory-motor concepts to literature as a product of the imagination is that “imagining and doing use a shared neural substrate” (Gallese/Lakoff, 2005, p. 456), i. e. when one imagines seeing something, the same parts of the brain are used as when one actually sees. Or when we imagine that we are moving, some of the same parts of the brain are used as when we actually move. Movement, perceived on a screen or represented in a text, may cause cognitive processing analogous to real-life movement. This notion can even be extended to the use of metaphors. It has been shown that not only actual and imagined physical activities, but also physical events evoked in metaphors (Lakoff/Johnson, 1999, Schrott, Jacobs, 211) and idioms (Boulenger, Hauk, Pulvermüller, 2008) can be related to the motor cortex. The whole development in philosophy and psychology from Descartes’ dualism of *res cogitans* and *res extensa* to modern views of the interconnectedness of body and mind in Antonio Damasio’s reference to the “embodied mind” (Damasio, 1984, 1999) or Matthew Ratcliffe’s understanding of feelings as “bodily states” (Ratcliffe, 2008), which provides a cultural context for recent advances in cognitive science, cannot be treated within the frame of this article. If certain developments in the philosophy and psychology of feeling lead to concepts which come close to what is called embodied cognition in cognitive science, this contribution will discuss literature as another significant area of cultural production which can be related to the context of embodied cognition.

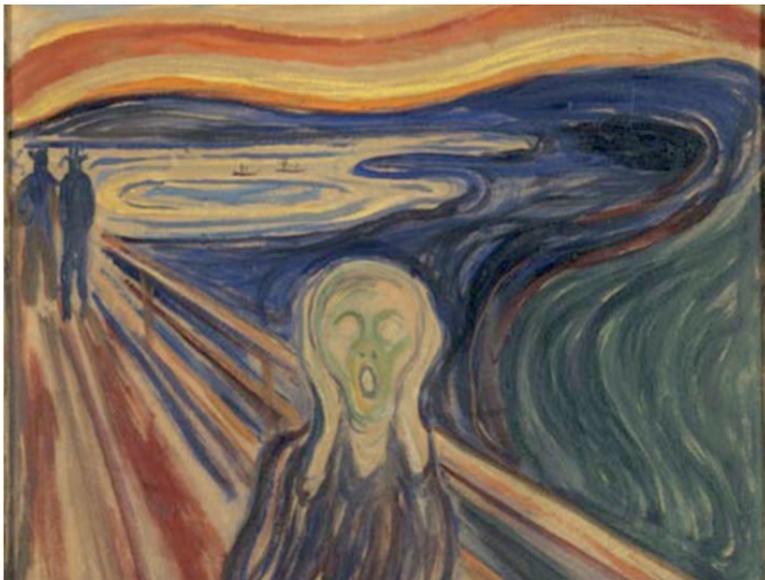
2 Motion and Emotion

The starting-point of the following investigation is the fact that the representation of emotion in literature is – analogous to emotion in actual life – essentially constituted by motion and other physical or physiological manifestations. The etymology of the word is already significant. *Emotion* is derived from the French verb *émouvoir*, which is based on Latin *emovere* – in the Latin verb the preposition “e” means “without”/“out of” and *movere* means “move“. The connection of the phenomenon of emotion with motion

is ubiquitous in general language use, as the following randomly chosen metaphorical words and phrases show: “Gefühlsbewegung”, “revulsion of feeling”, “he fell in love”, “he fell into a depression”, “his heart started pounding when he saw her”.

Before starting our investigation, at least one piece of evidence from neuroscience for relating emotion and motion will be adduced to support our procedure by cognitive research. A team of researchers from Cambridge and Berlin made experiments on 18 persons, using magnetic resonance imaging to compare brain activation evoked by emotion words to that evoked by face- and arm-related action words. (Moseley, 2011) The result was that emotion words evoked activity in the motor brain systems. That means that emotion words activate the motor system in a way comparable to action words. So the attempt to correlate emotion and motion is corroborated by findings of neuroscience. For what holds true for actual reality can also be taken granted for imagined reality.

If we look at the representation of emotion in literature, we notice that it is, as is the case in actual reality, essentially constituted by motion and other physical or physiological manifestations. This holds true for visual art, too, as Edvard Munch’s painting “The Scream” shows.



Edvard Munch, *The Scream* 1893, National Gallery, Oslo

The hands of the screaming person are elongated and pressed tightly to the head. The mouth is wide open; so are the eyes, empty and unfocussed. The person is not actually in motion. The painting shows a face freezed with horror, which is the result of a movement, which is also reflected in the landscape. Munch's work is an outstanding example of the visual representation of embodied emotion. However, we must be aware of the fact that the painting is a work of art, of great art at that, and not what cognitivists would normally study. It transcends what is accessible to scientific experiments. But it is based on a principle on which many modern scientific theories of emotion are founded, namely that emotion is largely manifested in the body.

3 Facial Feedback in Narrative Prose

Textual analysis will begin by examining the representation of facial and other physical activity in narrative prose in relation to emotion. Cognitivists like Adelman and Zajonc interested in the phenomenon of emotion have emphasized "the role of emotional facial action in the subjective experience of emotion" (Adelman, 1989, p. 249). Adelman avoids 'the convention of referring to emotional facial action as "expression" since this term imposes an a priori theory, implying that emotional facial action (facial efference) has its major role in the manifestation of internal states.' (Adelman, 1989, pp. 249–250). While I agree with Adelman and Zajonc in avoiding subjectivist and expressionist theories, I take the liberty of using, at times, the term "facial (or bodily) manifestation" rather than "facial efference" ("efferent", 'carrying or conducting outwards from a part or an organ of the body, esp. from the brain or spinal cord').

Before looking at the representation of facial manifestation in literature, attention will be drawn to a famous experiment carried out by Fritz Strack (1967) which is relevant to our argument. This is the so-called *pen experiment* which proves the facial feedback hypothesis from a scientific perspective. Subjects had to hold a pen in their mouth in ways that either inhibited or facilitated the muscles usually associated with smiling. Holding a pen with the teeth only was considered a facilitating condition since it involved the muscles active in smiling; holding a pen with the lips only was considered an inhibiting condition, since it did not involve or, rather, inhibited the muscles associated with smiling. Subjects who had the pen between their teeth showed more intense humour responses, when cartoons were presented to them, than subjects who had the pen between the lips. The question of the quality of the response – affective or cognitive – cannot be discussed here. (See Dem 1967.)

Narrative texts in which a great amount of bodily and facial activity is represented are novels of the Thirties and the Forties of the last century (Dashiell Hammett, Raymond Chandler, Ernest Hemingway etc.), which I some time ago termed the behavioristic novel (Müller 1981). In this kind of narration the representation tends to leave out internal description and concentrate on outward physical manifestation, i. e. on what cognitivists call facial and bodily feedback. Here is an example from Hammett's novel *The Glass Key* (1931):

- (1) When he [Ned Beaumont] rose from the telephone he was smiling with pale lips. His eyes were shiny and reckless. His hands shook a little. (Hammett, 1975, p. 127)

That physical activity suggests emotion in these sentences is indicated by the reference to the character's smile and by his "reckless" eyes. Yet what he really thinks remains unstated. It may be a challenge to the reader to reconstruct his undisclosed thoughts along the lines of the theory of mind. (Zunshine, 2006) Our capacity for mind reading can be in demand if we are confronted with real people just as with literary figures. We may encounter analogous situations in real life and in the fictional world of the screen or the book. When a person's gestural and facial activity goes without words we have to perform a cognitive achievement. An example from one of Raymond Chandler's novels, which are told by the I-narrator Philip Marlowe, represents the body action of a person, who has committed body-stripping, from the narrator's perspective. The following quotations have been collected from the scene in question, in which pressure is put on the character by the narrator:

- (2) Tiny beads of sweat showed on Flack's lip above his little moustache. – He hunched down in a chair and stared at the corner of the desk. After a long time, he sighed. – His eyes were small and thoughtful. His tongue pushed out over his lower lip. – I stopped and watched the faint glisten of moisture forming on his forehead. He swallowed hard. His eyes were sick. – He just sat there and stared at me with his nasty little eyes half closed and his nasty little moustache shining. One of his hands twitched on the desk, an aimless movement. (Chandler, *The Little Sister*, 1975, Chapter 11)

The emotions of the character remain unspecified. The representation is restricted to outward physical manifestation. Yet the effect on the reader is to perceive, in a cognitive act, the character as extremely uncomfortable. Nor is the narrator's response explicitly communicated. His attitude of distaste and contempt is only suggested by the dinginess and meanness of the described person and by the adjective "nasty" which is applied to

the eyes and moustache. The representation of his own facial activity as a response is not possible for the narrator, for the text is written in the form of I-narration. Yet it is astonishing to what extent the narrator applies description of physical details also to his own body, as the two following examples show:

- (3) I grinned suddenly, bent over and quickly and with the grin still on my face, out of place as it was, pulled off Dr. Hambleton's toupee [...] (Chandler, 1975, *The Little Sister*, Chapter 9)
- (4) Then I put it [the telephone] down very slowly and looked at the hand that held it. It was half open and clenched stiff, as it was holding the instrument. (Chandler, 1975, *The Lady in the Lake*, Chapter 28)

In the first quotation the narrator describes even a facial manifestation – grinning, the grin on his face –, which he cannot see. For the explication of more complicated examples we have to refer to the concepts of mirror neurons and theory of mind. To do so in a graphic way we will first look at a painting which refers to a complex situation of interfacial response, Nicolas Poussin, “Landscape with a Man Killed by a Snake” (1648). The reason for the shift of our argument to another art medium is that an interfacial phenomenon is, in this ocular form, easier to grasp and interpret.



Nicolas Poussin, Landscape with a Man Killed by a Snake 1648, The National Gallery, London

This painting, which has been characterized as a “study in fear” and has been used as a cover image for Richard Wollheim’s book *On the Emotions* (1999), reproduces an

emotionally disturbing scene in an apparently serene Arcadian landscape. At the bottom of the left-hand side a man is being killed by a snake. From the right side a young man with terrified, pain-distorted face, turned to the spectator, is fleeing from the place of the accident. The emotional stress represented in the face is unfortunately not to be seen clearly enough in the reproduction of the painting, which is exhibited in the National Gallery in London. In the middle of the painting there is a woman, who from her position cannot perceive the place of the accident. But her face and posture assumes the same pained appearance as the man's. Her agitation is also shown in her wild gestures and her forward-bending posture. She may be screaming. If she were a real person, we would have to say that her motor cortex has been activated most strongly by the running man she is seeing.

Poussin leaves the accident itself almost in the dark. The painting's emphasis is on the emotions reflected in the faces of the two other figures. The fact that the woman, though not knowing the reason for the man's fear, shows the same physical evidence of fear as the man, can be, from a contemporary scientific vantage-point, explained by the theory of mirror neurons. This theory, which I referred to earlier in this paper, is based on the empirically gained insight – first derived from the observation of monkeys – that the same parts of the brain are active when a person performs an action as when the person sees another individual performing the same action. (Rizzolatti: 1999, 2526–2528) This phenomenon can be explained in terms of the facial feedback theory. It would also be possible to explain Poussin's scene of facial interaction in terms of the theory-of-mind concept.² This would mean that the woman in the painting, looking at the frightened face of the man, forms an idea of what he feels and feels the same by way of empathy, as her facial aspect indicates. In fact, in a recent article on face-to-face interactions Martin Schulte-Rüther et al. (2007) applied both the Mirror Neuron Theory and the Theory of Mind to face-to-face interaction. I personally would prefer to describe the scene in the painting under discussion as face-to-face interaction with embodied cognition on the part of the woman. She empathizes with the man on account of the pain manifested in his face, the empathy causing motor activity. That mind reading and cognition belong together is stated by Alan Richardson's following quotation: "What's termed our 'theory of mind' [...] would be greatly impoverished if we did not have a reasonably reliable, and therefor largely unconscious, cognitive mechanism for gauging the emotions and intentions of others through reading their faces." (Richardson 2010: 65)

² This was suggested to me by my colleague Dirk Vanderbeke.

Let us now look at two passages in Raymond Chandler's novel *The Little Sister*, where the protagonist realizes his emotional state only by looking at himself in a mirror:

- (5) Passing the open door of the wash cabinet I saw a stiff excited face in the glass. I went over to the wash-basin and washed my hands and face. I sloshed cold water on my face and dried it off hard with the towel and looked at it in the mirror. 'You drove off a cliff all right,' I said.
(Chandler, 1975, *The Little Sister*, Chapter 23)
- (6) I got up and went to the built-in wardrobe and looked at my face in the flawed mirror. It had a strained look. I'd been living too fast. (Chandler, 1975, *The Little Sister*, p. 133)

These examples may be a far cry away from Lacan's theory of the mirror phase in which the child for the first time succeeds in recognizing and identifying him/herself as a complete self in front of a mirror, but the look of the protagonist at himself in a mirror in the novel by Chandler also has a cognitive function. In the passages quoted the narrator finds out something about himself by looking at himself. In the first example the narrator even talks to his face. It would be problematic to apply the mirror neuron concept to self-perception in the two passages, for one would have to assume self-division in the observer, in which one part of the self observes the other part, although a dual self is indicated in the first quotation, which refers to "a stiff excited face" and not to "my stiff excited face". The protagonist even addresses his face. The two examples could be explained as special instances of the theory of mind applied to a character finding out something about his person by looking at himself in a mirror. However, more plausible would be the reference to Daryl Bem's "self-perception theory". This theory explains that people form new attitudes and beliefs, including those related to the self, from observing their own behavior. Bem (1967) maintains that people deduce their own internal states, like attitudes and emotions via the same processes by which they deduce the internal states and dispositions of others. Specifically, Bem assumes that people use their facial expressions as a source of information to infer their own attitudes. This is what happens in the two quotes in which Philip Marlowe looks at his own face in the mirror. Before the mirror the character comes to self-perception and partially also to conclusions concerning the state of his mind. Be that as it may, in the context of sensory motor concepts the novels by Hammett and Chandler provide abundant evidence of embodied cognition.

4 Emotion as Cognition I: An Example from Narrative Prose

As for emotion, I am making a wide claim, namely to postulate that emotional experiences, whether actual or imaginary, are cognitive events, to which sensory motor processes contribute essentially. A similar position has been taken by Meyer-Sickendieck (2012) who regards the perception of moods as cognitive acts which have a profound effect on the body. Physical manifestations like the body shaking, the heart beating faster, eyes being averted and facial expressions like smiling or tears are more than "physiological accompaniments", as Oatley states (Oatley, 1994, p. 53, Oatley, 1992. p. 20–21), but, looked at in the context of the present project, they are part and parcel of cognition. In this respect the approach taken here differs from Raymond Gibbs' important chapter on emotion (Gibbs, 2005, pp. 239–274), which focuses on consciousness rather than cognition. I can, however, not refer to empirical evidence for substantiating my assumptions concerning the representation of emotion in literature. Meyer-Sickendieck pursues such an empirical project, as he declares in the conclusion of his book, but his methodology does not seem to reach the precision of brain scientists. As a literary critic I have to rely on literary texts. Since poetic language does not differ radically from everyday language and since poetic language frequently evinces linguistic features which are a heightened form of normal speech, my examples may perhaps be not without relevance for linguists and cognitive scientists.

I will begin with an example of narrative prose, a passage from William Faulkner's novel *Light in August*, which deals with the fate of a white African-American:

- (7) He turned into [the street] running and plunged up the sharp ascent, his heart hammering, and into the higher street. He stopped here, panting, glaring, his heart thudding as if it could not or would not yet believe that the air was now the cold hard air of white people. (Faulkner, 1971, p. 88)

Here physical action emerges as emotion, be it fear or revulsion. While running from a district of blacks to a district of whites, the protagonist passes through different emotional states. As frantic as he may be, he is aware of what happens. The passage represents motion and emotion and cognition in an insoluble conjunction. Emotion *is* motion, as the pounding heart indicates. The passage can be regarded as an extreme literary example of embodied cognition, in which the sensory-motor component goes together with cognition.

5 Emotion as Cognition II: Examples from Romantic Poetry

Romantic lyric poetry represents, on the whole, a strongly subjective and intimate form of discourse which with its orientation on the individual self tends to be at variance with the socially established systems of discourse which, according to Niklas Luhmann (*Liebe als Passion*, 1982), influence linguistic and literary representation. It may be objected that it makes no sense to approach this kind of poetry, which is to a large extent characterized by interiority, from the point of view of the sensory-motor concept. I will try and show that such an objection would not be justified. My analysis begins with a look at a notoriously emotional poem, which has a curious aspect that had puzzled me for a long time until I looked at it in terms of the sensory-motor concept. It is Percy B. Shelley's "The Indian Serenade". In this poem it is intense emotion which makes the lover "arise from dreams" of his beloved and forces him to her chamber-window. Emotion inevitably concurs with motion. The speaker declares that it is a "spirit in my feet" which leads him to her window:

- (8) And a spirit in my feet
Hath led me – who knows how?
To thy chamber window, Sweet! (Shelley, 1970, p. 500)

The puzzling phrase in this poem is "a spirit in my feet". For a neuroscientist it may seem absurd or downright silly to locate a "spirit" in a foot. But it is interesting that Shelley, who could not know anything about neuroscience, felt the need for a physical source or agency which caused the action of his lover, a source interestingly different from the heart which would in the cardiocentric tradition (Niemeier 2011) be responsible for a lover's action. The heart or the soul is, at least in this poem, not the seat of the feelings. Nowadays we would of course retrace the source of the lover's motion in the poem to his brain. In want of any such concept the foot had to serve as a kind of substitute. The passage explicitly illustrates a coincidence of emotion and motion with cognitive implications. Cognition is involved in the self-observation and the self-description of the poems' speaker.

The following quotations from romantic poems provide evidence for the hypothesis that emotion tends to be represented as cognition and to be embodied in motion in the poetry of the age. Lines like –

- (9) I die! I faint! I fail ("Indian Serenade", Shelley, 1970, p. 580)
(10) I pant, I sink, I tremble, I expire! (*Epipsychidion*, Shelley, 1970, p. 424)

- (11) My heart aches, and a drowsy numbness pains
My sense, as though of hemlock I had drunk,
Or emptied some dull opiate to the drains
One minute past and Lethe-wards had sunk:
[. . .] (“Ode to a Nightingale”, 1–4, Keats, 1970, p. 207)

– have traditionally been called subjective or self-expressive. The most important representative of a poetics of expression which accounts for such texts, emphasizing notions of subjectivity and expressiveness, is M. H. Abrams’ famous book *The Mirror and the Lamp* (1953). In the light of sensory-motor concepts such poems should rather be called self-diagnostic or self-reflexive. It is significant that in all these examples emotion coincides with motion. Emotion manifests itself in physical terms or, more precisely, in motion. This is the case even in the lines from Keats’ ode, although the depressed state of having “sunk” down is described only on a metaphorical level. Poetry intensifies here what we have noted above with reference to everyday language, namely that emotional states are frequently expressed in physical terms, for example in words like “downcast” (German “niedergeschlagen”) or “spurred” (German “beflügelt”). Keats is, incidentally, one of the greatest diagnosticians in English poetry, which reflects his deep interest in medicine and new ideas in brain anatomy and neurophysiology. (Richardson 2010: 75) Here is another example. In “Ode on a Grecian Urn” the “happy” world depicted on the urn is described, which is far above “all breathing human passion”

- (12) That leaves a heart high-sorrowful and cloy’d,
A burning forehead, and a parching tongue. (Keats, 1970, p. 210)

The lines refer to an emotion of extreme sorrow, but the terms in which it is represented are intensely physical or sensory, almost in the form of a medical diagnosis. Self-description is intensified to the point of self-diagnosis: the heart is sickened, the forehead burning, and the tongue dried out. The great amount of physical manifestation in these and many more cases is a testimony of cognition rather merely accompaniment of it.

In order to point at the recipient’s side of an embodied understanding of emotion I will quote a passage from the poet A. E. Housman’s famous lecture *The Name and Nature of Poetry* in which he equates the emotional effect of poetry with a physical one:

- (13) Experience has taught me, when I am shaving of a morning, to keep watch over my thoughts, because, if a line of poetry strays into my memory, my skins bristles so that the razor ceases to act. This particular symptom is accompanied by a shiver

down the spine; there is another which consists in a constriction of the throat and a precipitation of water to the eyes: and there is a third which I can only describe by borrowing a phrase from one of Keats's last letters, where he says, speaking of Fanny Brawne, 'everything that reminds me of her goes through my like a spear'. The seat of this sensation is the pit of the stomach. (Housman, 1933, p. 47)

This is an extreme example of the effect of poetry caused by emotions which react on the body in a multitude of ways from a bristling of the skin to the sense of being penetrated by a spear in the pit of the stomach. The importance of the physical side in the representation of emotions, which is emphasized in my argument, could be supplemented by investigations of the production and the reception side of the poetic process, which is not possible within the frame of this article.

6 Embodied Cognition in a Modern Poem

The lyrical poems dealt with so far have been taken from romantic poetry. To give just a glimpse of embodied cognition, which continues to emerge, in varied forms, in later poetry, at least one twentieth-century poem will be adduced. In this context the study by Burkhard Meyer-Sickendiek has to be referred again, *Lyrisches Gespür. Vom geheimen Sensorium moderner Poesie*. (2012). Meyer-Sickendiek is strongly interested in the lyric representation of fugitive moods which are barely felt out by a sensitive subject and he discusses the corporeality of perception. His theoretical approach, which is focused on mood ("Stimmung") rather than feeling, is related to the New Phenomenology of Hermann Schmitz. It provides the basis for extremely subtle analyses. Although it does not refer to sensory-motor concepts, it ties in with the present study, since it understands the apprehension of a mood ("das Erspüren einer Stimmung") as a cognitive act. The poem to be looked at here is by William Carlos Williams:

(14) To a Poor Old Woman

munching a plum on
the street a paper bag
of them in her hand
They taste good to her
They taste good
to her. They taste
good to her

You can see it by
the way she gives herself
to the one half
sucked out in her hand
Comforted by
a solace of ripe plums
seeming to fill the air
They taste good to her
(Williams, 1951, p. 99)

In this poem there is a total focus on the woman who is eating plums with the greatest relish, even sucking the fruit from her hand. Her feelings of sensuous pleasure are denoted by the statement “They taste good to her”. Even the last stanza, which articulates a kind of epiphany, is concentrated on smell and taste. In the second stanza it is the device of repetition with the shifting of the line ends within the repeated sentence, – an intricate counterpointing of syntax and meter – which has an iconic and intensifying effect. The shifting enjambment mimes the process of munching and savouring the plums. The notion of embodied feeling is here expressed by a distinct poetic technique – repetition. The last stanza conveys a sense of satisfaction which transcends the limits of the object beheld. Emotion words refer to sensuous contentedness (“Comforted / a solace of ripe plums”) and an impression of the air being filled with the smell of plums (“seeming to fill the air”) is evoked. There is also a cognitive component in the woman’s pleasure. She obviously knows what she is doing and she enjoys what she is doing, as it is suggested by the repeated clause, “They taste good to her”. The poem is an interesting case in that in addition to the visual dimension it includes the senses of tasting and smelling. Its imagery is multisensory. (Starr, 2010) It is one of the purest examples of embodied feeling in poetry.

7 Emotion Manifested in Kinetic Body Metaphors

From a cognitive point of view there is hardly a difference between metaphor in general and in literary language. Lakoff and Johnson argue that human thought and speech are constructed metaphorically from the basic kinesthetic experiences of living in a body (Crane 2010: 104). In an illuminating experiment Boulanger, Hauk and Pulvermüller (2009) could show that idioms – which contain action metaphors like “grasping the idea” – activate the motor cortex just as non-figurative expressions referring to action

do. Their conclusion is that “Motor systems of the brain, including motor and premotor cortex, and the motor cognitions they process appear to be central for understanding idioms.” (Boulanger, Hauk and Pulvermüller 2008: 1913) Metaphors which refer to motions of the body like

- (15) My blood freezes – I could vomit – He fell into a tumult of contradictory feelings –
Grasping ideas requires some intelligence

are not radically different from metaphors in poetry. The most important difference seems to be that poetic metaphors usually strive for the quality of novelty or originality. It can be said that metaphor is a supreme device of expressing emotion in poetry. It is in fact a catalyst of emotion. Also in this context the relation between motion and emotion, which is our topic, is particularly frequent, as the poems quoted above show. Further evidence is provided by the following examples from Gerard Manley Hopkins’ so-called *terrible sonnets* (Poems 65 and 67):

- (16) No worst, there is none. Pitched past pitch of grief,
More pangs will, schooled at forepangs, wilder wring. (Hopkins, 1967, p. 100)

- (17) Selfyeast of spirit a dull dough sours. (Hopkins, 1967, p. 101)

- (18) I am gall, I am heartburn. God’s most deep decree
Bitter would have me taste: my taste was me;
Bones built in me, flesh filled, blood brimmed the curse. (Hopkins, 1967, p. 101)

In each of these instances extreme emotions are rendered in physical terms: in the first case spiritual pain manifests itself physically in terms of wringing pangs, in the second the self’s spiritual helplessness is expressed by the image of the leaven of the self, unable to raise a dough, and in the third metaphors of taste are used to express the emotional state of the self, which is, in the absence of God, thrown back on itself and has to taste itself. It should not be forgotten that these are written or rather printed words, condensed dust on the page, if you do not read them aloud, and yet there is an enormous sense of physicality to them;³ the body as the testimony of emotions is powerfully present, for, as we have argued, the respective areas of the brain are activated regardless of their metaphorical character. At the same time Hopkins’ lines evince great self-awareness and self-perception on the part of the speaker. Again I

³ I am aware that reading a poem silently also has a sensory quality. If this was not the case, sound effects and the rhythmical quality of the poem would remain unnoticed. The exploration of this phenomenon would be another challenge of cognitive research.

would not like to call such poetic discourse self-expression. On account of its strong cognitive quality I would prefer the term self-definition or self-diagnosis.

8 A Note on Embodied Cognition in Literature and the Historical Aspect – Shakespeare

The examples adduced for embodied cognition in the context of the representation of emotion have been taken from nineteenth and twentieth-century literature. The textual corpus should, of course, be extended to earlier literature, and it should be asked whether historical developments can be identified in the treatment of the relation of emotion and motion in literature. A first impression gained during the research for this study is that a climax of embodied cognition and emotion is to be found in the literature of the romantic period. However, it is evident that further historical research and an expansion of the corpus are needed. Petrarch's *Canzoniere*, for instance, one of the most important models for lyric production all over Europe, has explicit descriptions of feelings in physical terms such as the lover's freezing and burning in his changing moods. It would certainly be fruitful to look at Petrarch and his tradition or at metaphysical poetry with respect to embodied feeling and cognition, but I would like to have just a brief look at Shakespeare, who in this, as in so many other aspects, proves to be quite modern. Darwin quotes him as one of the chief authorities on human expression. (Alan Richardson 2010: 71) There is no room to go into Mary Thomas Crane's important study on conceptual metaphors in *Shakespeare's Brain*. (2000) First, two lines from Hamlet's first soliloquy are to be quoted:

- (19) O that this too sullied flesh would melt,
Thaw, and resolve itself into a dew,
(Shakespeare 2005, p. 113, Act I, Scene 2, ll. 129–30)

Hamlet's disillusionment with his family and his self-loathing are manifested in physical terms, in his desire for his body to melt away. The protagonist does not in the first place refer to his feelings of depression, but his psycho-physical condition. Hamlet's world-weariness manifests itself in a desire for the dissolution of his body. Another example is Macbeth, who contemplates murder to gain the crown, yet is so terrified by fear that the image of murder unsettles his bodily functions,

- (20) [...] why do I yield to that suggestion
Whose horrid image doth unfix my hair,

And make my seated heart knock at my ribs,
Against the use of nature? (Shakespeare, 1971, p. 21, Act I, Scene 3, ll. 134–37)

Here again the image of the body's life, with the hair standing on end and the heart knocking at the ribs, coincides with the protagonist's feelings. In fact, the physiological event is not a mere symptom, but a manifestation of mental disorder. There is also a pronounced cognitive dimension in the passage, in the form of self-observation and self-diagnosis. Macbeth feels an emotion and simultaneously perceives it as a manifestation of the body.

An examination of modernist poetry could lead to the result that there are poets like T.S. Eliot and Wallace Stevens who tend to write 'disembodied' poetry, i.e. poetry that is averse to embodied cognition, while others like Ezra Pound and William Carlos Williams are in favour of embodied cognition. As early as 1988 Max Nänny wrote an article on Ezra Pound as a "Right Brain Poet". By way of analogy one could call T.S. Eliot a left brain poet. But such classifications should be treated with caution from a cognitive and historical point of view. As far as Eliot is concerned, his theory of the "dissociation of sensibility" could be discussed in terms of the cognitive approach.

9 Conclusion

It may be objected that the material treated in this study is rather diversified and disparate and that the evidence presented moves freely between genres and periods, but as an extenuating circumstance it can be pointed out that an innovative approach is tried out in this contribution, which opens new perspectives and is waiting to be substantiated in a more comprehensive and systematic procedure. Some results can at least be ascertained. Emotion and motion have turned out to be two sides of a coin. Motion is understood as the kinesthetic experience of the body, which comes into play with any emotional experience, no matter whether in real life or fiction, although the literary artist has aesthetic strategies at his or her disposal which make possible intensified representation of emotion. Analyses have shown that literature is a veritable field for experimentation in matters of embodied cognition. Embodied cognition could be identified in the representation of facial feedback, both in views from outside (external) and from inside (internal). The thesis that emotion is closely linked to physical manifestation, that emotion is actually inseparable from motion has been confirmed in numerous examples from narrative prose and poetry. The application of the term "sensory-motor" to cognitive phenomena represented in literature proved to have certain advantages,

since it allows for the appreciation of different aspects of body activity involved in cognition (changes of the position of the body, movement of the limbs, facial expression, smelling, taste), which could be found in the instances of represented emotion examined. It should be noteworthy and encouraging for cognitivists and neuroscientists advocating sensory-motor concepts that in literature there is massive evidence for their theories from times in which nobody as yet dreamed of neurons let alone sensory-motor concepts. The interdisciplinary benefit can be mutual, the literary scholar profiting from the mind and brain scientist exploring hitherto unknown dimensions of human reality, and the scientist learning that poets have all along known more about the mind's construction than they would have believed possible.

10 References

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