To Pablo and Cecilia.

Table of Content

Prelude

Sense-making unfolded

Christina Regorosa on Shown & Told by Meg Stuart and Tim Etchells[1]

An empty space. A space of infinite potentialities waiting to be realised. Meg Stuart and Tim Etchells as passages of latencies.

3rd-person perspective: "It's like…"

It is not being explicitly asked, but the answers suggest that the question "what does it feel like" or in other words the qualia of movement in space is being addressed.

In his attempt to interpret movements so as to read Meg Stuart's "dance of suggestions",[2] Tim Etchells is also continuously moving. The answers he keeps proposing are just as ephemeral as Meg Stuart's dancing. At a rapid pace, the two artists thus design and discard micro- and macro-universes of possible meanings, images, and associations. Zooming in, zooming out, here and now, here again and elsewhere, they take us on the continuous process of sense-making. They demonstrate the aspects of creation and the failure, which are both equally inherent in sense-making processes. The certainty of designation never has the chance to establish itself. They invite us to participate in the impossibility of capturing dance in the playful effort of finding words intended to generate meaning. It's an indication, an explanation, an interpretation, a re-interpretation, a de-interpretation, an association, a dissociation, because: "It's like words fading in front of your eyes."

This creates a space of ambiguity, in which the various readings not only stand side by side but overlap, shifting towards the absurd, while springing up and instantaneously fading again. If the characteristic feature of dance is transition, the torrent of words illustrates precisely this: the transition from one possible interpretation to the next. A space where nothing is clear-cut: "It's like straight lines that are more like circles or more like dots."

[1] Published in TQW Magazine 2019. Online: https://tqw.at/en/sense-making-unfolded/. The original text was written in German (https://tqw.at/sense-making-unfolded/), the translation has been adapted slightly for this thesis.

[2] Meg Stuart in the artist talk, 23 November 2018, TQW Hall G

Then there's a preliminary answer that seems like a full-stop at the end of a sentence. "It is like this." The search for suitable words comes to a standstill. Language dries up and resigns in a gesture that points at the dancing body. On the floor, Tim Etchells mimics Meg Stuart's movement and indicates a spot with his finger. Language is subdued. In the end, this is exactly what language is: a finger that points at something. The primacy of language is coming to an end. The loss of language. Change of perspectives.

1st-person perspective: "I dance because…"

Meg Stuart offers possible answers to the question of "why". Is this going some way to explain the phenomenon of dance to us? Can questions relating to causation lead to meaningful explanations? A narrative that is plausible because the human species is trying to understand the world by way of stories? Doesn't a story, in fact, indicate the meaning we attach to it? Or do we long for understanding? Are we grasping at concepts in order to ultimately be able to understand the meaning of the experience without having to die from it? What does it mean to dance, to experience oneself as a sensuous being? Is dance looking to explore the full range of possible sensory experiences insofar as to not be content with a metaphor that refers to something but rather to deliberately expose oneself to the intensity of potential states of being and to seek out the space of potential meanings without defining them?

"I dance because it leaves no traces."

Co-sense-making: "Building cities"

Tim Etchells resumes his attempt and refers to well-known illusions in our perception, which raise the underlying question: are we perceiving or projecting beings? His torrent of words is no longer purely associative but becomes increasingly narrative in structure while still rejecting to be unambiguous.

"It's like cities that are built on memory and run on forgetting. Or it's like cities that are built on forgetting and run on memory."

What is the fabric that our coexistence is made of? Is it rainbows, words, plastic bags, music, insects, perfume, sighs, or stories? Or nothing? Is our material and immaterial reality nothing but a constructed illusion? What physical effort is needed to get rid of these contingent bundles of meaning?

Negotiation: "I am here. Are you there?"

Two narrative strands that are not connected with each other. Two people who tell their stories and in doing so identify themselves as individuals who occupy different positions and can take a stand by way of generating a self-image through the narrative. An increasingly static counterpoint to the flow in the beginning, culminating in a powerful image: holding an uncomfortable position on the floor, Tim Etchells embodies a rigid proposition that yearns for some room to manoeuvre.

After letting the audience take a peek into their individual universes of meaning, Meg Stuart and Tim Etchells release the audience into the vast scope of meaning they have opened, with a hint, with a potential jump into the…

Introduction

The piece 'Shown and Told' by Meg Stuart and Tim Etchells perfectly reveals the process of sense-making. The notion of sense-making as it has been coined in cognitive science is of enactive provenience. Enactivism conceives of cognition as sense-making alluding to an inclusive concept of biological, affective, and abstract cognition. This thesis is concerned with sense-making in the domain of performance art. While contemporary dance has the power to "show" what sense-making entails by displaying it and sharing this experience with the audience, the primary modus operandi of science takes place within the confines of the written language. Thus, I will engage with "telling" the story of sense-making, and interestingly enough, this process of writing a scientific narrative is an act of sense-making too.

Although my essay suggests that I have understood the piece as I claim what it reveals, I do not know for sure. Are we "shown" how concepts can be stirred, twisted, and literally moved around? Are we being "told" fragmented narratives, and witnessing their composition and decomposition? Are we left with a story that is unfinished and a plot that remains unclear? The answers are not clear, and it does not matter. What *matters* is that the performers shared with us a way of approaching the world shaping the space with sound, movement, and their presence.

Contemporary dance is multifarious and unpredictable. It transgresses borders and pushes the boundaries of any confined understanding of what this art form could encompass. Despite its elitist aura it is sweaty and physical, despite its direct physicality it remains somewhat opaque. Despite its fleetingness it has the power to become deeply engrained in an individual's and in cultural memory. Dance is, while at the same time, dance is not. That is the paradox of contemporary dance.

The question of what contemporary dance is all about has been with me implicitly since the first performance encounter. Yet it only became more explicit for me in more recent years when asked to explain it. Instead of giving an "interpretation" of what I think I saw or experienced in a particular piece, I found myself arguing that there is nothing really to "understand". And there is certainly nothing one is *obliged* to understand for being able to appreciate dance art. What I realized in these informal post-performance talks was that somehow the idea of being able to wrap one's mind intellectually around a performance was related to the ability for appreciating it. Understanding a piece would mean having a hold on it and pin it down even if it is just in one's memory or should I say fantasy?

However, because of these interesting conversations, my aesthetic stance towards contemporary dance became clearer to me. In my view, contemporary dance pieces offer experiences that I cannot label or categorize... at first. But instead of being insecure about

whether I have understood the meaning of the piece, or the intention of the artists, I dwell within the experience of the fleeting unknown. Labelling my experience immediately would collapse me back into what I already know. Resisting this impulse to immediately categorize, refrains me from mapping my experience before it had a chance to emerge. Resisting the impulse for categorization prevents me from assuming with my labels but instead remaining with the unknown possibilities - naked so to speak without the comforting categorial container. Lingering in this unknown space is what makes contemporary dance exciting for me.

This is how I would phenomenologically describe my personal aesthetic response. Responses of course vary substantially: the range extends from leaving in the middle of a performance, enthusiastic applause with standing ovations, to having an uncontrollable laughing attack. Brandstetter (2007) poses:

> Dance has a special power of evoking moments of enchantment, enthusiasm or shock that render ›speechless‹ in certain respects; on the other hand, this experience of speechlessness often supports the prejudice that it cannot involve knowledge. (ibid., p. 43)

She hints at another paradox of contemporary dance: the relationship between dance and knowledge which connects well to my personal question of understanding contemporary dance. However, this thesis will not be concerned with an analysis of a dance piece as a means to contribute to understanding this art form by creating knowledge about contemporary dance as often practiced in dance scholarship. Rather, it seeks out the mechanisms by which we come to understand this performance art. It therefore touches on more general questions such as: what does it mean to understand? What does it mean to know? Or put in enactive parlance: how do we make sense of the world?

The questions for this thesis are more specific: what does it mean to understand contemporary dance? Does understanding refer to decoding signs into meaningful interpretations? Is it about reading movement and assembling them into a narrative? What does contemporary dance convey; what kind of knowledge or meaning is being shared with the audience? How can this knowledge be characterized? Finally, if we accept my personal position that understanding in art can also mean being tossed into the unknown; how can a dance piece evoke this sensation of uncertainty?

The tension between dance and knowledge has been the topic of substantial debate in the first decade of this millennium (Gehm, Husemann and Wilcke, 2007a). It culminated in April 2006, when the German Federal Cultural Foundation organized the first dance congress in over

fifty years at the House of World Cultures in Berlin (Völckers, 2007, p. 9) under the header 'Knowledge in Motion'. The revival of the tradition of the dance congress was significant for it is widely held that dance and its knowledge are marginalized in our society (Klein, 2007, p. 28). The dance congress made dance politically visible and offered a platform for discussing its role in our current knowledge society (ibid., p. 26).

The project was focused on conceiving of 'dance as a culture of knowledge' and therefore examined 'the practices of validating, disseminating and making use of dance knowledge' (ibid.). It resulted in a collection in which dance scholars and artists alike pondered on how the modes of knowing, characterising contemporary dance, can be defined (Gehm, Husemann and Wilcke, 2007). Unfortunately, the discourse has ceased because the problem of how to theorize on tacit, implicit, or experiential knowledge that per definitionem is discursively inaccessible, remained unsolved. In the field of philosophy only few attempts have been made to work towards an epistemology of dance (Parviainen, 2002; Risner, 2000), and to my knowing neither of these have been taken up for further development.

In my master's thesis, I seek to extend the discussion by drawing on theories and recent developments in the field of cognitive science. More specifically, I will select strands from the subdisciplines philosophy of mind and neuroscience. Embodied and enactive approaches as well as recent findings in the field of neuroaesthetics of dance have not or merely partly been considered so far. My hypothesis is that these subfields of cognitive science can fruitfully contribute to laying a foundation of an epistemology of contemporary dance. The aim of this thesis is to enliven the academic discourse on dance and knowledge and offer some constructive incentives in the form of productive insights that hopefully serve as fuel for the discourse to gain momentum again.

For my endeavor, I begin by providing a definition of contemporary dance focusing on its central practices. This will be followed by an analysis of the discourse on dance and knowledge and the first attempts of working towards an epistemology to identify the dead ends and the weak points in that discussion. Subsequently, I will introduce the three selected subfields of cognitive science research with the analytical objective of showing why these approaches lend themselves well for tackling the question at hand. Finally, I will suggest an epistemological framework that blends insights from dance research with findings of the respective fields. Given the scope of the thesis, I can only delineate the ground for an epistemology in the hope that it will inform future inquiries along the proposed lines.

1 Defining Contemporary Dance

Dance is movement in time and space and its opposite.
(Merce Cunningham)

As with all art forms, in dance there exist different styles and genres, and as with most of contemporary artwork, choreographic practices and dance performances became hybridized and difficult to categorize (Clavadetscher and Rosiny, 2007, pp. 12–13). It follows that the characteristics cannot be found by looking at dance pieces per se given the variety of appearances of contemporary dance. We have to stretch our lens beyond the results of choreographic processes, and even further beyond choreographic processes themselves and into the heart of this exciting and multifaceted art form: its values and practices that embody values in and of themselves, on one hand, and the processes in which the artform actualizes into full being i.e., in the encounter of dancers and audience during a performance.

Laurence Louppe elaborates on exactly these aspects in her extensive account of contemporary dance as an artform. With *Poétique de la danse contemporaine* (2009), she intentionally sets herself apart from studies that are concerned with dance in a sociocultural and historical context for two reasons: she argues that these anthropological analyses approach a dance piece rather as an object and conceive of the body merely as a symptom of its contextual embeddedness. She also considers her approach different from another group of dance scholars, who understand dance as a means of critically thinking about the political and social context, in which the dancing body occurs (Louppe, 2009, pp. 21–22). While these are certainly productive analyses, their focus does not further our understanding of the phenomenon of contemporary dance and its meaning beneath the level of sociocultural significance of a particular piece performed at a certain point in time. Understanding contemporary dance, as my title suggests, therefore refers to my interest in the processes of understanding rather than in generating interpretations. I am interested in what understanding means and which procedures it encompasses. In other words, I aim at looking at the how - how this artform moves us - rather than the what - what it stands for.

1.1 A Poetic Approach

Nevertheless, formulating a definition of contemporary dance, we have to first adjust our lens by drawing on Louppe's account of poetics. In her understanding, poetics encompasses not only an investigation of what moves us when perceiving art, but also of how art is created (ibid.,

p. 13). It considers the procedures that precedes the art event as well as its perception that echoes in aftereffects post hoc. Such an encompassing approach renders the dichotomy between an acting and a perceiving entity superfluous, she argues. It 'devectorizes', she explains drawing on Genette: communication is no longer considered unidirectional, rather art is positioned in the midst of the art practice that involves artists and audiences alike in the artistic process (ibid., pp. 13–14).

To her, in the artform of dance there is an encounter of bodies that enter an exceptional, intensified dialog, which can be investigated by using a poetic approach (ibid., p. 15). This dialog primes the aesthetic processes with three distinctive characteristics: 1) the dialog encompasses an encounter in time and space, 2) time and space cannot be postponed, and 3) time and space sustain a perceptual experience. As such, her account of poetics aims at an analysis of shared aesthetic experiences and their effects on sensuous perception on both the dancer and the spectator (ibid.).

Finally, her choice for a poetic approach is motivated by the fact that understanding the art of movement necessitates the integration of its knowledge - a knowledge that is expressed through practices. This implies that not only the knowledge *of* dance (historical and theoretical knowledge) is important to her approach, but also that the dance practices are of equal importance. She asserts that the artistic process of creation already starts within those practices that dancers apply to educate themselves in these tacit realms (ibid., p. 16). Thus, for her, it does not suffice to consider the final product as the only means to understanding this artform. She strives for including the procedures that are 'at work in the work itself' as she puts it (ibid., p. 17, translation CR).

1.2 Subject and Perception in the Poetic Approach

Her approach comes with other interesting remarks on the conceptualization of the recipient and therefore the encounter. While she thinks of herself (as the subject that analyzes) as motile as her research interest, she also takes the recipient as 'dispersed': moving between discourse and practice, between feeling and acting, between perception and realization (ibid.). The spectating or analysing subject is far from being granted a static position; rather, it is considered as an agent that circulates between layers of perception. In that way the subject is "embodied" by the means of its attention, as does the artwork materialize through its analysis (ibid.). The multi-layered form of perception also implies that the gaze, as a means of attending to a dance performance, is just one dimension of the aesthetic process. It is not solely through the visual sense that we come to apprehend a dance piece. It is the whole body that perceives with all

available sensory channels (ibid., pp. 17-18), and it is the totality of perceived, internalized, and experienced movements or choreographies that determine the locus of perception (ibid., p. 23). The spur of dance movements, as Louppe puts it, imprints in the body of the mover as well as of the absorber[3] (ibid., p. 18). Therefore, Louppe argues, the poetics of dance should be located within this transitional and liminal space; in that *in-between* in which the exchange of bodily states are negotiated (ibid.).

As the author clarifies the position of the gaze as subordinate, she puts the kinesthetic impressions to the foreground. After all, these are the diverse as well as intimate perceptions a dance performance has to offer. Drawing on Laban, she argues that the modality of kinesthetic impressions addresses the sensuous and the emotional, and therefore, the core of our being; however, they also activate our understanding of the world in a similar way as discourses do via 'denotative communication' (ibid., pp. 22–23). Thus, kinesthetic impressions (in)form the body in a similar way as inscription and habitualization do. While the latter two forms are commonly recognized in cultural studies and sociology, Louppe acknowledges the effect of kinesthetic impressions as evenly important.

1.3 Values of Contemporary Dance

Having established the premises of her account, we can now move on to her definition of contemporary dance. In her analysis she defines contemporary dance by common values. I find this remarkable for this kind of definition considers the diversity of appearances in contemporary dance. The values she lists are the uniqueness of the individuality of the body and a gesture, the idea of production in contrast to reproduction of a gesture, the work on the substance of the body and the self, the practice of not anticipating the form of movement, and the crucial role of handling gravity[4]. She also mentions moral values such as authenticity, respect for the other body, the principle of non-arrogance, the search for a consistent solution, rather than a spectacular one, and the transparency of the applied processes (ibid., pp. 31-32).

[3] I propose to refer to what I have until now named audience, recipient and spectator which I find all lacking and misguiding, the term absorber.

[4] I quote the original text: „[...] die Individualisierung eines Körpers und einer Geste, für die es kein Vorbild gibt, und die eine Identität oder ein Vorhaben ausdrücken, die durch nichts zu ersetzen sind. Die ›Produktion‹ (und nicht Reproduktion) einer Geste (ausgehend von jedermanns eigener Empfindungssphäre – oder einer tiefgehenden und bewussten Zustimmung zur Grundsatzentscheidung eines anderen). Die Arbeit an der Materie des Körpers, der Materie des Selbst (die sich in subjektiver Weise oder im Gegenteil über die Alterität vollzieht); die Nicht-Vorwegnahme der Form (selbst wenn, wie bei Bagouet oder Lucinda Childs, im Vorfeld choreographische Pläne festgelegt werden), die bedeutende Rolle der Erdanziehungskraft als Antrieb der Bewegung (egal ob man mit ihr spielt oder sich ihr hingibt)."

For the purpose of my thesis, I want to highlight one particular value, namely, the work on the substance of the body and the self - also referred to as movement research (see chapter 2.1) or somatics (a term coined in the 1970ies by Thomas Hanna as an umbrella term for different movement awareness methods, see Mangione, 1993, pp. 43–49). I consider somatics as the core characteristic of contemporary dance which can be substantiated historically:

Delsarte, who has been declared as forefather of modern dance (historically the predecessor of contemporary dance), has invented a system and a method consisting of observation, research practices and exercises which have been protocoled by his student Genevieve Stebbins. His achievement was the discovery of another body through the practical investigation of asemic body parts (those which are not used for gestures, such as the torso) (Louppe, 2009, pp. 43-50).

Mangione (1993) recognizes the linkage between modern dance and somatics. According to her, pioneers of the modern dance movement such as Francois Delsarte, Emile Jacques-Dalcroze, Rudolf Laban, Isadora Duncan and Mary Wigman have influenced and contributed to the field of somatics (ibid., p. 27) by shaping an understanding of the body that is still the shared ground of somatics and dance.

Eddy (2009) too observes mutual influence between the field of somatics and dance. Even if the first generation of somatic practitioners such as Frederick Matthias Alexander, Moshe Feldenkrais, and Mabel Todd did not come from the field of dance, their methods are ever present in dance trainings and workshop schedules up to this very day (Irmgard Bartenieff, a dancer, student of Laban and founder of 'Bartenieff Fundamentals of Movement', is the only exception). The second generation of somatic founders, however, often began their careers as dancers: Elaine Summers developed 'Kinetic Awareness', Bonnie Bainbridge Cohen founded 'Body-Mind-Centering', and Joan Skinner the 'Skinner Releasing Technique' (ibid., pp. 16-19) to just name a few. Finally, numerous dance professionals and companies as well as dance academies and workshop festivals have integrated somatic methods in their training, curriculum or workshop offer (ibid., pp. 20-21).

So, what does this work on the substance of the body entail, and why is it crucial for understanding contemporary dance?

1.4 Somatic Practices

Louppe (2009) has termed this resource of contemporary dance practices as 'dance work' (ibid., p. 24), and she understands it as:

> [...] das Vermögen des Körpers, aus seiner eigenen Materie die Quellen seiner größten Energie hervorzubringen. Wie bei der Arbeit des Gebärens, interessiert uns das Vermögen des Körpers, Lebendiges aus seiner eigenen Materie auszuscheiden. (ibid., pp. 24–25)

According to Louppe, being a contemporary dancer means relating to the world through the body and bodily movements. As such the body is the instrument for knowing, thinking, and expressing alike. It means trusting the lyric nature of the organic without necessarily drawing on a certain aesthetic form. The neutral gesture or unstressed state of the body is considered of lyric quality as well, just like the gesture that is intentionally stressed. The focus of the 'dance work' is directed at the 'organic preconditions of these poetic manifestations' (ibid., p. 51).

The organic preconditions concern the body and the bodily state. Louppe argues that the great dance artists of modernity were significant because they had invented their own distinct corporeality. From this created or reinvented corporeality, they developed techniques (Hawkins, Cunningham) or their own philosophies about dance expressed in dance (Duncan, Wigman). Thus, modern dance offered different perspectives: each new dance technique was an expression of a specific thinking of and altered perspective on the body (ibid., p. 62).

But how can a perspective on the body be altered? First, it asks from the dancer to develop a sensitive consciousness towards her own body, and this inquiry is a never-ending process (ibid., pp. 51–52). Secondly, it requires an exploration of the body in a highly concentrative, meditative stillness, in which the bodily subject seeks to discover itself (ibid., p. 53). For Eddy (2009), this mode of exploration and common feature of somatic methods meets the criteria of creative work (ibid., p. 23). Indeed, the poetic procedures of these explorations - Louppe refers to them as displacement and defamiliarization - were reinventing the body, as the bodily anatomy and functions were being rethought in the period of modernity (Louppe, 2009, pp. 55-56).

In more pragmatic terms, somatic methods share the starting point of becoming aware of the body by paying attention to the breath and bodily sensations often in a gravity-reduced state lying on the floor. The International Somatic Movement Education and Therapy Association (ISMETA) defines the commonalities of somatic methods as follows:

> Practices of somatic movement education and therapy encompass postural and movement evaluation, communication and guidance through touch and words, experiential anatomy and imagery, and the patterning of new movement choices - also referred to as movement patterning, movement re-education or movement re-patterning (Eddy, 2009, p. 8).

While in the context of somatic movement therapy the purpose of movement re-patterning might primarily aim at an improvement of movement coordination for pain reduction, the purpose in an artistic context is being described by French dancer and choreographer Dominique Dupuy as follows:

> [Der Körper wird, CR] in eine Situation am Rande der Leere gebracht; er ist nicht von vornherein konstruiert und ausgerichtet. Er befindet sich in einer Art Abwesenheit, einer Art Stille, aus der alles heraus entstehen kann. (cited in Louppe, 2009, p. 53)

While somatic methods can 'improve movement coordination that supports structural, functional and expressive integration' as they help 'recognize habitual patterns of perceptual, postural and movement interaction with one's environment' (Eddy, 2009, p. 8), and therefore improve dance technique in the sense of skilled movement, in the artistic realm other criteria are guiding the attention of the exploration. Louppe (2009) quotes Irene Dowd, an American choreographer and somatic pracitioner:

> Es gibt weder ein richtiges (right) Bild, noch eine richtige Haltung, geschweige denn eine richtige Bewegung. Es gibt eine Art und Weise, zu funktionieren, die einen in einen bestimmten Augenblick gleichzeitig zur Einheit und zur Offenheit führt. (cited in Louppe, 2009, p. 54)

Louppe discerns the core of this approach which aims at transformation: the body enters its becoming through movement (ibid.). This is made possible by becoming aware through movement as one's attention is being guided verbally and/or tactically - not visually. As somatic methods 'refine perceptual, kinaesthetic, proprioceptive, and interoceptive sensitivity' (Eddy, 2009, p. 8), the visual impression or appearance of the body fades into the background. In fact, in contemporary dance, mirrors are not being used during training (Louppe, 2009, p. 54). The focus lies in the sensations and the intensity of those perceptual, kinesthetic, proprioceptive, and interoceptive sensations (ibid., p. 53). Somatics increase the capacity to visualize, and to listen to the body. It helps develop the resources of interoceptivity - an inner seeing, an inner listening, and an inner sensing as a felt experience. These 'fleeting moments' (Eddy, 2009, p. 25) are the loci of transformation and the work field of contemporary dance that allows access to the unseen through its procedures and techniques (Louppe, 2009, p. 57).

According to Louppe (2009) what characterizes the exploration in contemporary dance, is the investigation of asemic body parts, such as the stomach, the thorax, the back, the neck, and the shoulders, which led to a de-hierarchization of the limbs including the head as it

defamiliarized semic body parts. Consequently, the ideal of the anatomical body that had been canonized by classical aesthetics became infiltrated (ibid., pp. 55-57). She concludes:

> Der zeitgenössische Tanz hat die menschliche Anatomie und sogar die elementaren Körperfunktionen neu überprüft, manchmal sogar aus dem Zusammenhang gerissen oder verfremdet, um so, jenseits der zulässigen und erkennbaren Erscheinungen, all die anderen möglichen Körper herbeizurufen, jene poetischen Körper, die durch die Transformation ihrer eigenen Materie im Stande sind, die Welt zu transformieren. (ibid., p. 57)

But how exactly is the world transformed by contemporary dance? Can we trace the kinesthetic impressions and point out the transformation they have affected? How does the phenomenon of transformation appear: as disturbance, as understanding, as liking? Or is it just a fleeting moment that dissipates? Let us keep those questions in mind as we proceed with implications and insights concerning the conceptualization of the body that somatic procedures have brought about.

1.5 The Plurality of "the Body"

Louppe (2009) holds that the body in dance is the complex and rich material that has to be refined, being thought and experienced. It is an extraordinary tool of consciousness and sensibility, that neither can be conceptualized as separate from thinking nor opposed to it. Within contemporary dance, the traditional dualism has been overcome: the body thinks and 'makes sense' (ibid., p. 67).

However, the unity of body and mind that is experienced, explored, and exploited in contemporary dance does not imply that "the" body is a given. Quite the contrary is the case. Dance questions the essentialist conceptualization of the body as universal and unambiguous. It puts the absolute and the idea of naturalness into perspective by the means of its practices that involve the 'search for the becoming of the body' (ibid., p. 66). This inevitably leads to the notion of a body as a possibility, as a site inhabiting a plurality of bodies that can be discovered and, even more so, invented (ibid., p. 55). In her words:

> Denn der Tanz arbeitet, auf der Ebene des Denkens und der materiellen Gestaltung, an der Erscheinung eines Körpers, der nicht von vornherein gegeben ist. Oder vielmehr arbeitet er an einer Vielzahl von Körpern, von denen jeder einzelne wie eine geheime Partitur die unermessliche Bandbreite seiner Möglichkeiten und poetischen Schattierungen enthält. (ibid., p. 68)

Secondly, the body in dance is not reduced to its anatomical enclosures delineated by its skin. The body is understood in its three-dimensionality and its movement possibilities in space - owning space and existing in space. Laban refers to the surrounding space as the 'kinesphere' in which the body inscribes itself into space (ibid., pp. 58-59). Hence, even if somatic methods operate within the organic conditions of the body - its anatomical substance - the changes pervade the interrelations between the environment and the body. Space is merely one of those relational aspects (like time, gravity, and subjectivity), but the bottom line is that the body is understood as a network of interrelations.

Thus, in contemporary dance the body of interest is not the body that meets the visual criteria of form and perfection. In fact, it is not the material body that is at stake here, rather, it comes down to the bodily *state*. It is the ever-changing corporeality understood as an organized field of interferences (ibid., p. 68) that poses the workspace of contemporary dance. The interrogation of bodily states through somatics builds the capacity to reorganize the network of interrelations and interferences, hence, carrying out the procedures of defamiliarization and displacement that do not affect "the body" but the constellation of its network. Dancing then means making the sensory network visible (ibid.) which has undergone transformation through somatic inquiry. Understood in that way, Louppe proposes to look at the history of contemporary dance not by focusing on artistic decisions regarding form but rather by attending to decisions for specific bodily states (ibid., p. 63). Indeed, choreographers like Meg Stuart explicitly claim their primary interest in bodily states:

> We are always in a state. Perhaps the particular state that you are in is most clearly represented by an emotion you are experiencing, for example joy, regret or shame. Or the state is expressed in a physical way, like feeling wind on your face, tightness in your chest, a headache, holding someone's hand. Or in an energetic way, like feeling tired, relaxed or invigorated. (Stuart, 2012, p. 136)

She clearly denotes that affective experience and physical sensations cannot be clearly delimited. After all, the feeling of joy does invigorate the body. The sensation of wind in your face might evoke the feeling of freedom. Does tightness in your chest not leave a feeling of restriction? For her, states are 'a window into a different reality' (ibid., p. 137). They are a way of discovering hidden realities through exploring precarious states of 'bodies in crisis or out of control' (ibid.). She desires to display 'an uncertain body, one which is vulnerable and questions itself' (ibid.).

1.6 The Performance Encounter

Finally, the body and its movements are the locus of an intimate process that is not projected onto a pre-established (verbal) code (Louppe, 2009, pp. 36-37). Speaking of which, let us return to the phenomenon of this intimate process, this intensified dialog between bodies in a performance encounter. How does the transformation that has taken place in the dancer sediment within the absorber? What does Louppe mean when she speaks of kinesthetic impressions that leave a spur both in the dancer and the absorber? She rightly states:

> Es gilt, zu untersuchen, wie sich die Wahrnehmung des Zeugen mit dem Körper des Tänzers verwebt und so *mittels der Wahrnehmung eines anderen Körpers den eigenen Körper konstruiert*. (ibid., p. 63, emphasis added)

Nancy (2006) provides us an excellent philosophical account of this phenomenon. The essay *Alliterationen* (2006) revolves around two main topics: the encounter of bodies in a performance situation and the meaning of dance. As he describes the bodily experience of dance in a performance situation, the relation between the (dancing) other and the (absorbing) self is being revealed. He states that the other is another body in the first place. Despite the distance between these two bodies, the dancer echoes in the body of the recipient. Their relationship is thus characterized by resonance:

> Der Andere dort, nah in seiner Entfernung, gespannt, zusammengefaltet, entfaltet, auseinandergeworfen hallt in meinen Gelenken wider. Ich nehme ihn eigentlich weder mit den Augen noch mit dem Gehör noch durch Berührung wahr. Ich nehme ihn nicht wahr, ich halle wider. Hier bin ich gekrümmt von seiner Krümmung, geneigt von seinem Winkel, geworfen von seinem Schwung. Sein Tanz hat an meiner Stelle begonnen. Er oder sie hat mich deplaziert, hat mich beinahe ersetzt. (Nancy, 2006, p. 89)

By considering resonance as the inevitable mode of relating to one another, it follows that a body is not a single enclosed entity. Rather, the bodily echo transgresses bodily borders in such a way that it is not clear anymore where the other begins (ibid., p. 90). Ultimately, this leads to the question of where dance begins (ibid.). Nevertheless, in the absorbing body begins a process that he describes as follows:

> Immer noch kein Sinn, kein Sinneseindruck, aber unmerklich löst sich ein Körper aus sich selbst heraus. Er entschlüpft seiner eigenen Gegenwart, er zergliedert sich, er desartikuliert sich. Ein

> Anderer artikuliert ihn neu, lässt ihn eine neue Sprache sprechen, eine Sprache, die so verändert ist, dass sie hinter jede Sprache zurückgeht. Er weiß nicht, wie ihm geschieht: es kommt aus seinem Innern zu ihm, als wäre jenes Innere das Entfernteste alles Außen. Unmerklich kommt zu diesem Körper das, was ihn nicht länger Körper mit sich selbst sein lässt. Er nimmt Spielraum ein. Er nimmt Abstand ein. Er beginnt, sich zu denken. Er tanzt sich, er wird von einem Anderen getanzt. (ibid., p. 90)

The 'disarticulation' and the dissection of the absorber's body, but also the displacement of its own presence, creates latitude and distance, so that the body can begin to think of itself. The dancer's bodily presence - his or her embodied knowledge - takes over the absorber's body and makes demands with his or her thought that is concerned with imaging and inventing the absorber (ibid., p. 91).

Concerning the meaning of dance, Nancy asserts that dance cannot be accounted for as being directed at a particular sense, like fine arts are directed at the visual sense or music is directed at the auditory sense. Rather, dance *is* sense unfolding before senses are established (ibid., p. 97). The meaning of dance cannot be captured, it is motile and multiple, it integrates and disintegrates meaning and bodies simultaneously (ibid., pp. 96–97). The only concrete statement he makes regarding the meaning of dance, is that it invites to dance here and now (ibid., p. 97).

Nancy beautifully depicts that - when we "watch" a dance performance - the dance does not happen out there on the stage. It happens in the spectator's body and in the in-between. Louppe's poetics is in line with Nancy's description as it focuses on these shared experiences and how these alter sensuous perceptions on both sides (Louppe, 2009, p. 18). On the side of the performers, somatic inquiry and movement practices have inscribed in their bodies which are then brought to the shared experience of the performance and the absorber. Like Nancy, she speaks of 'vivid resonance' (ibid., p. 66) referring to the activation of the tactile dimension which is intimate and subtle (ibid., pp. 23, 65). The kinesthetic imprint offers kinesthetic impressions; the degree of resonance, however, depends on the receptivity of the absorber (ibid., p. 65). The resonance can be experienced as a merging or a conflict (ibid., p. 66), but the crucial point of the encounter is the phenomenon of experienced resonance.

We have come closer to the notion of what understanding contemporary dance means by drawing on Louppe's poetic lens. Even if there is still a lot to say about the artistic use of time and space - time as a poetic force and space as moldable material that is made visible and brought forth through movement (ibid., pp. 121-137, 154-183) -, what I have pointed out so far is sufficient for the purpose of this thesis. We have zoomed into two integral aspects of

contemporary dance: a) the procedures that are 'at work in the work' induced by somatic inquiry, b) the performance encounter and what it entails if understood as an intensified dialog between bodies evoking resonance within the tactile dimension of our beings.

How do these aspects tie in on epistemological issues? Approaching the very same aspects from an epistemological angle, we could state that a) is an explanation of what dancers know and how they attain their knowledge; while b) is an elaborated account of what is commonly referred to as the aesthetic experience that sheds light on how this knowledge is being shared and experienced. Louppe's detailed account on these aspects provides an informative and orienting framework that I will be returning to in chapter 3 where my discussion will engage with cognitive science.

But first, I would like to call upon voices in the field of dance scholarship that have pondered on the relationship of dance, movement, and knowledge. While these contributions are essay-like with the aim of opening the field of discussion by proposing possible pathways, I will also consider the few works that explicitly address epistemological issues concluding that dance does not fit into the theoretical corset of traditional epistemology. The following two subchapters ought to give the reader an insight into the epistemological hard problem that dance poses: the problem of bodily knowledge.

2 Relating Dance and Knowledge

In what follows, I would like to present some proposals of how to relate dance and knowledge. These proposals are taken from the collection *Knowledge in Motion* (2007b) which had been published after the occasion of the *Tanzkongress* that was held in 2006. The essays in this collection are based on two working hypotheses: '(…) executing a dance movement entails specific knowledge. At the same time, dance requires and facilitates extraordinary processes of understanding' (Gehm, Husemann and Wilcke, 2007a, p. 15). These fundamentals are also reflected in the title.

More specifically, the editors were interested in providing a bundle that reflects on questions such as: 'what defines body and movement knowledge? How and through which means is it generated and passed on? How are practical cognitive processes reflected?' (Gehm, Husemann and Wilcke, 2007a, p. 16). Including artistic as well as scientific views, it gives an impression of how 'knowledge production in and about dance' has been discussed theoretically fifteen years ago. For my thesis, it is an indispensable source to reflect on what an epistemology of contemporary dance necessitates.

2.1 Body and Movement Knowledge

Let us begin with pondering the guiding questions that Gehm and colleagues have laid out. A first step to define body and movement knowledge is to delineate it from dance knowledge. A useful distinction for dance knowledge in general is when it refers to a particular dance genre or a specific technique that comes with a characteristic bodily habitus. For example, all dancers learn how to perform movement with respect to weight, momentum, space, and time; however, a ballet dancer will realize movement differently than a Cunningham-trained dancer. In contemporary dance, however, there does not exist one dominant aesthetic regime that comes in the disguise of a technique (as Louppe has described earlier), which is why it is necessary and utterly important to interrogate body and movement knowledge apart from dance knowledge. Thus, let us assume that dance knowledge is being passed on as training in a particular technique in a classical 'demonstrating/copying' (Sieben, 2007, p. 144) way of teaching. What about body and movement knowledge then? Through which means is it passed on?

Body and movement knowledge is being generated by what I consider the defining aspect of contemporary dance practices; it is what Louppe (2009) refers to as the 'dance work' (ibid., p. 24). As I have stated earlier, this work forms an essential resource for contemporary dance. Historically, this is supported by the fact that Western modern and postmodern dance have been heavily informed by somatic methods (Eddy, 2009; Louppe, 2009, pp. 70–71; Mangione, 1993; Sieben, 2007). Such 'movement and body-orientated learning methods' (Sieben, 2007, p. 137) enable dancers to deeply investigate their bodies, and to explore basic movement material such as standing, walking, or simply lifting an arm. By doing so, they sensitize their bodily perception and movement patterns. Currently, this kind of exploration is often referred to as 'movement research' (Sieben, 2007, p. 143) or 'kinaesthetic research' (Gehm, Husemann and Wilcke, 2007a, p. 20). Examples for methods used and often integrated in class are Alexander Technique, Body-Mind-Centering, Feldenkrais, Klein Technique and many more. Sieben describes some of those approaches[5]:

Alexander-Technique was brought forth by Frederick Matthias Alexander (1869-1955), an actor who often lost his voice. In observing and exploring his patterns of muscular hypertension, he discovered the disturbing factors in his actions. The main strategy - besides self-observation - of Alexander-Technique is to suspend movement and therefore inhibit the automatized

[5] For a more detailed account see Eddy 2009.

routine, so that the body unlearns unhealthy habits and learns to move in more economic ways in terms of muscular tension and organization of the body (ibid., pp. 138–139).

Body-Mind-Centering is rooted in the study of anatomy, Ideokinesis, yoga, Japanese martial arts, and neuro-physiological concepts of learning, and has been developed by Bonnie Bainbridge Cohen (ibid., p. 141). It offers ways to relearn infant movement patterns like crawling (ibid.). Cohen's work is based upon the fact that the motor spinal nerves in the foetus develop first (ibid., p. 142). Hence, the bottom line is that sensorimotor functions provide the basis for experience, perception, movement, and expression (ibid., p. 141).

The Feldenkrais-method offers guided sessions (so-called ATMs which is the acronym for Awareness through movement) in which movement is approached as a self-experiment. With this method, Moshe Feldenkrais wants to evoke a childlike learning of movement by using trial and error, so that movement patterns, which are the basis for behavior patterns, can be newly assessed and reorganized. This again results in a clear self-image (ibid., pp. 140-141).

Even though the details of their philosophies differ, all somatic methods share a few essential commonalities: the basic procedure that is at work in those methods is what in phenomenology is described as *redirecting attention*. Sieben (2007) also strikingly refers to the forefathers of somatic methods as 'practitioners of phenomenological research' (ibid., p. 138). This gesture of *redirecting attention* consists of shifting one's attention from what is being perceived to the perceiver, hence, to one's own perceptual apparatus and patterns. To support this redirecting, clients are guided verbally and via touch. There is no demonstration of movement sequences that should be copied; rather, verbal instructions are offered as a proposal or an invitation to experiment without any pressure of accomplishing a movement in a "correct" way as pointed out earlier by Irene Dowd. Since this work is about experiencing, it is also referred to as 'experiential research' (ibid.). Sieben (2007) describes how the founders of somatic education led their phenomenological research: 'In the process they were simultaneously subject and object, seeker and expert: through participation and experience' (ibid.).

Thus, contemporary dance practices integrate somatic methods which enhance body knowledge through increased body sensitivity and an active reflection on movement patterns. This in turn results in a better dance technique on the one hand; on the other hand, this exploration of the body plays into the aesthetics of contemporary dance which is why I consider somatics-informed dance practices as *the* characteristic element.

Hence, the exploration of the body can also be described as the poetic procedure of defamiliarization, which allows discovering 'all the other possible bodies, poetic bodies, that

by virtue of their own transformation have the potential to transform the world' (Louppe, 2009, p. 57, translation CR). Therefore, as a dancer enhances her bodily perception, she gains a different proprioception on her body. Poetic procedures can be considered as a change of perceptual configuration of the sensing organism through which the environment is perceived and experienced thereby stirring the socially-(in)formed and bodily imprinted perceptual grid.

2.2 Dance Knowledge

Let us now turn to dance knowledge which represents another important subset of the dancer's expertise; dance is skilled movement and requires training in that aspect it can be compared with physical expertise in sports. Dance is an immensely nuanced and rich manner to engage the moving body. In this sense, it is feasible to speak of 'automated knowledge' (Klein, 2007, p. 29) but only when it comes to dancing skills and habits that are technique related. Still, the distinction between body or movement knowledge and dance knowledge that I am insisting on, is not explicitly made by the authors I discuss here. Nevertheless, the problem of classifying dance knowledge has been perfectly captured in the sociological analysis laid out by Klein (2007):

> Traditionally, modern concepts of dance have defined dance knowledge as a physical, transient, non-classifiable type of knowledge, bound more to experience than to cognition. […] The idea of dance knowledge as direct, physical, practical knowledge has always contributed to the myth of dance, and also to dance being either marginalised as ›the other‹ (something separate from society or culturally irrelevant) or idealised precisely because of its emotionality, irrationality and physicality. (ibid., p. 29)

This definition raises questions: how to make this 'specific, physical kind knowledge' accessible to (scientific) discourse (ibid., p. 25)? Does its physical nature truly prohibit its discourse (ibid., p. 28)? Is it therefore solely to be understood as 'the negation of modern knowledge' based on emotionality and irrationality while the other resides in the realm of rationality and reason (ibid., pp. 28–29)? How can this challenge be met theoretically?

Klein (2007) asserts that these questions touch upon a 'knowledge theory of dance or perhaps a physical theory of knowledge' (ibid., p. 25) which includes subtopics such as 'knowledge and experience, knowledge and education, physical and instinctive knowledge, the exchange of knowledge, knowledge archives and knowledge transfer which outline dance as culture of

knowledge' (ibid.). She envisions a theory that is informed by interdisciplinary academic discourse (ibid.).

However, her essay is concerned with dance knowledge from a social-science perspective. In her proposal to approach dance as a hybrid culture of knowledge, she states that the 'body does not speak, it displays' (ibid., p. 32). I certainly agree, but it is also important to ask: what is it that "the body" displays? An unusual configuration of bodies or body parts, unsettling movements, emotional states taken out of a narrative logic and context? Does "it" display the artistic process of discovering bodies as Louppe (2009) suggests. Maybe strange, traumatized, or ecstatic bodies, afford us a perception of those bodies and consequently a different experience our own bodies?

Klein (2007) suggests that the body displays what it knows and more specifically, it displays a type of narrative knowledge. By drawing on Lyotard's distinction between narrative and discursive knowledge, wherein the first consists of what we are told and is implicitly legitimized by itself, and the latter is primarily created by science and requiring explicit legitimisation, Klein proposes to categorize dance knowledge within the first one:

> For dancers, dance knowledge is a type of knowledge based on a physical experience which conveys itself inter-subjectively – in this case via bodily communication. This sort of knowledge could be identified as a specific type of narrative knowledge. (ibid., p. 32)

But it remains unclear what the specificity entails. According to Klein, the body conveys a narration, a message, an idea; yet it does so beyond the binary logic of language. I am not in line with that distinction because it still foregrounds dance knowledge against the backdrop of language.

However, drawing on Stuart (2012) and her interest in bodily states which 'have consequences; they have *potential* narrative' (ibid., p. 137, emphasis added), we might add to Klein's proposal the potentiality of possible narratives that arise of certain bodily states – as it has been perfectly captured in *Shown and Told*. I propose that contemporary dance operates within the space of potentiality, rather than being concerned with constructing a narrative. It is the openness of dance performances, the affectively graspable states, and the polyvalence of the undefined that characterize contemporary dance.

2.3 Dance as a Scenography of Knowledge

Finally, let us turn to Brandstetter (2007) whose framework I consider highly relevant for an epistemology of contemporary dance. I would like to ponder on her first answer to the question of the specific knowledge of dance:

> A different kind of knowledge from what we generally accept as rational, technical or discursive knowledge. The scene for this different kind of knowledge is set in the moving body. The knowledge that becomes apparent and is transferred in dances and choreographies is dynamic: physical, sensuous and implicit knowledge. It is conveyed in a kinetic and kinaesthetic manner. Can this be called knowledge at all? […] Where does the resistance against such a physical and performative idea of knowledge come from, causing us to adhere to our familiar oppositions of theory and practice, of rationalism and emotionality, of body and mind? (ibid., p. 40)

Brandstetter rightly points out that the difficulty of defining dance knowledge has to do with *our*[6] assumptions about knowledge being abstract, logical, and bound to language. More importantly, she reveals the underlying logic beneath this challenging task which is binary and boils down to the mind-body problem. But she does not stop at characterizing dance knowledge as physical and sensuous, as knowledge inscribed in the dancers' bodies. She also considers the performance situation, the setting, the shared space in which the encounter occurs:

> This is the stage, the liminal stage between performance and observation, where a dialogue begins. It is an experiential space in which not only the events on the dance stage (meaning all the spaces and processes of a performance) become perceptible. No, this is not a one-sided gift, it is reciprocated. The inter-est of the spectators, their concentration invests in the process. In so far the experiential space of ›knowledge‹ doubles or multiplies even further in size: a space in which the dance scenography is superimposed on the attention span of the viewer/listener. (ibid., p. 44)

Just like Louppe (2009), she speaks of the performance encounter as a dialogue with equally important partners. As such, it is a social encounter in a specific circumstance; a setting in which the experiential aspect is emphasized. It is a space in which the performers shape the space and share their experience of shaping it - their expertise. Also, she speaks of performances not only as a dance scenography, but as scenography of knowledge (Brandstetter, 2007, p. 46). In doing so, she acknowledges the spatiotemporal dimensions of a dance performance which alludes to

[6] I would like to make explicit that she refers here to Western thought and philosophy.

the composed (or improvised) configuration of bodies in space and time which form a 'situational knowledge' (ibid.).

Moreover, she addresses the question of apprehending contemporary dance in an informative way by pondering on the aesthetic experience. While she reserves a place for knowledge and expertise about contemporary dance, she nevertheless stresses that the locus of the aesthetic experience is in the direct perception of dance:

> The aesthetic experience – the perception of art – takes place in a realm beyond informational knowledge about art – although it may not be quite unrelated because the complexity of the experience is made up of an individual mixture of memory, knowledge, perception, anticipation, and desire. However, the aesthetic experience is primarily sensuous and emotional – and therefore activates a different knowledge than, for example, the solution of a mathematical problem. […] However, the knowledge in question is a different kind of knowledge: sensual, erotic and unstable – and it goes without saying, also cognitive; knowledge that touches on the boundaries of knowledge and zones of non-knowledge (also and in particular of ›not-knowing-oneself‹). One of these boundaries is indicated by the absence of language for this knowledge gained through experience. (ibid., p. 43)

Note how she links non-knowledge to self-(non-)knowledge, hence, to the potential knower that delves into the uncertainties evoked by a performance. Moreover, it is interesting how she charts the relation between the unstable knowledge, the boundaries of what is known and the zones of non-knowledge. This description is more adept to the fragmentariness and indeterminacy of contemporary dance, but it does not suggest the dynamicity of the process of not-knowing, grasping, feeling bored, coming to know, questioning again, feeling uncomfortable, realizing something, forgetting it again, laughing.

Also, when she compares the aesthetic experience in dance to the experience of solving a mathematical problem, I am not quite sure if she is right. Does solving a mathematical problem actually exclude the sensuous and emotional realm? Does it really activate a different kind of knowledge? Or are we just used to disregard these domains by having learned to adjust our perceptual grid, as our bodies and therefore our perception have been socially (in)formed into a habitual thinking that we have not learned to interrogate and even less so to transform? After all, is experience really in opposition to cognition?

Lastly, she acknowledges the active role of the absorber in this space of knowledge sharing:

> With the autonomy of the dancers and the openness in the structural flow of the dance, the observer also acquires his own autonomy: the freedom to endow what he has seen and perceived ›as dance‹ in his own way with images and experiences belonging to his own knowledge (ibid., p. 46)

As I have mentioned earlier, the absorber is not obliged to parse the piece as if there were a hidden meaning to uncover. Brandstetter (2007) explicitly addresses the freedom to engage with the piece with what one knows and eventually comes to know. Or not. The absorber enters 'the field of the unforeseeable, the unknowable, the uncontrollable as a challenge for a different experience (…)' (ibid., p. 47).

2.4 Relating Arts and Science

Let me summarize what has been said so far. Concerning body and movement knowledge, Sieben (2007) describes some of the body-oriented learning methods which enhance body and movement knowledge by increased body sensitivity and a reflective awareness of movement patterns. She basically looks at the practices in which body and movement knowledge is generated, passed on and attained.

Klein (2007) elaborates on the problem of making dance knowledge discursively accessible and how this impossibility to categorize dance knowledge has contributed to its marginalization in our society. She proposes to situate dance knowledge in opposition to discursive knowledge as a specific type of narrative knowledge that is being displayed and communicated intersubjectively via bodily communication.

Brandstetter (2007) characterizes the specific knowledge that dance generates, but more importantly, she locates this kind of knowledge in its context as she frames performance settings as scenography of knowledge and performance situations as experiential knowledge spaces. Moreover, she determines the deep-seated dichotomies that make it virtually impossible to integrate dance knowledge to the prevalent conceptualization of knowledge.

Although the discourse on the relation between dance and knowledge is rich and full of interesting proposals, these suggestions have not been worked out into an epistemological theory of contemporary dance so far. As a matter of fact, the discourse on the relationship between dance and knowledge has ceased. Why?

When we analyse the contribution on the meta-level, it is noticeable that all essays try to derive insights by contrasting dance knowledge against the backdrop of scientific knowledge. This runs like a red thread through all theoretical contributions discussed above. Consequently, the discussion operates within binary conceptualizations of knowledge of various sorts: discursive/non-discursive, physical/mental, discursive/narrative, sensuous/emotional versus

logical/reason. Taken together with the repeated observation that language cannot enter the domain of dance knowledge, these variations of dualism become fatal because it leaves dance scholars with literally no possibility to ever bridge this gap which in its basic form is the mind-body problem. Let me finish off with a temporary answer drawing on Brandstetter (2007) and Klein (2007) once more.

Both authors assert that dance and dance scholarship inherently is a critique of science that might have an impact on our common understanding of knowledge and science. Klein (2007) emphasizes the fact that science forms knowledge as an attempt 'to grasp dynamic processes through static concepts' (ibid., p. 33) which becomes strikingly obvious when science engages with the involvement of dance. On the other hand, both endeavors - science and art - convince by means of perception: 'even if the scenarios and the effects of this perception differ: cognitive but yet not *only* cognitive in the case of science; sensory but nevertheless *also* cognitive in the case of art' (Brandstetter, 2007, p. 42, original emphasis).

Even though the contrasting opposition is being upheld, the boundaries between the cognitive and the sensory dimension are softened by making the distinction a question of degrees. This quote suggests that a possible way to enliven the discussion is to move towards a different understanding of knowledge. Is a physical theory of knowledge like Klein (2007) suggests a feasible approach to rethink our prevalent knowledge model: leaving behind 'our familiar oppositions of theory and practice, of rationalism and emotionality, of body and mind' (Brandstetter, 2007, p. 40)? Let us keep this question in mind as we proceed by looking at two contributions to formulating an epistemology of contemporary dance.

3 Towards an Epistemology of Contemporary Dance

Parviainen (2002) focuses on the concept of bodily knowledge seeking to clarify the intuitive concept of 'knowing in and through the body' (ibid., p. 14). The practical question that drives her inquiry is: why can dance teachers teach dance students movements they themselves cannot execute anymore? Her main purpose is to provide evidence of bodily knowledge and to show how it forms the basis for dance knowledge. Her investigation starts off with a feminist critique on traditional epistemology. Then she turns to cognitive psychology and phenomenology to show how movement is prior to cognition. Finally, she draws on Polanyi's concept of tacit knowing and Ryle's distinction between knowing that and knowing how to argue that there is a distinction as well as a connection between skill and knowledge.

In contrast to Parviainen's theoretical account, Risner (2000) tackles the question by exploring how dancers construct knowledge during the rehearsal process of a choreography. His approach is based on a qualitative interpretive interview method taking their subjective experience into account and thus making their epistemic stance visible. Even if his article is reaching out to choreographers and pedagogues, his work is informative for my thesis as it addresses epistemological issues and seeks to establish basic elements of an epistemology that contests the premises of traditional epistemology. His analysis of the dancer's narratives reveals the nature of knowing which is body-mediated and clearly posits body and mind as 'a unified site for knowledge construction' (ibid., p. 169).

3.1 Contrasting Approaches

Parviainen (2002) has two crucial questions in mind: Firstly, *what* do dancers know, and secondly*, how* do dancers know (ibid., p. 13). Her article focuses on the first question of *what* dancers know as they become skilled. Her analysis reflects on bodily knowledge in relation to movement skills showing how movement reshapes the bodily schema which serves as a source for teaching movement even if a dance teacher is not capable of performing the movement anymore herself.

She (2002) rightly points out that a central task in developing a theory of knowledge that also covers contemporary dance, is to 'analyze bodily knowledge and its relation to bodily skills, techniques, and articulated knowledge' (ibid., p. 23). She concludes that this endeavor will result in 'a synthesis of different modes of knowing' (ibid.). In her critical reflection on traditional epistemology, Parviainen explicitly addresses the fact that the knowing subject is not taken into consideration. Drawing on feminist epistemology she restores the position of the subject that produces knowledge:

> This [traditional, CR] conception of knowledge does not reflect on the subject who produces it. […] Since all knowers are situated - historically, culturally, socially, spatially, temporally, kinesthetically - all the dimensions of situation become part of the epistemological context. Each being has its own life history and perception, its own pattern of structurally coupled interaction with the world. This implies that knowledge is always self-referential and reveals something about the knower. In other words, knowledge bears marks of its producer. And because knowing has bodily roots, it is also to some extent unique. (ibid., p. 12)

This quote already hints in the direction of an encompassing epistemology based on enactivism, one of the strands within cognitive science. The emphasis on the situatedness, the

ontogenetic structure of the perceiving subject, and the notion of structural coupling are central ideas in enactive cognitive science. However, she does not explicitly mention the origins of those theorems nor uses or elaborates these notions in her further analysis.

Risner's account however is informative for the second question: *how* do dancers know? Rather than merely presenting it as a framework, he takes the inherent subjectivity of knowledge serious in choosing a method that is interested in the dancers' experience. His approach takes subjectivity and 'personal meaning making' serious, as he investigates human experience (Risner, 2000, p. 157). His notion of knowing rests on the underlying rationale that knowledge 'is situated in and dependent upon a social context' (ibid., p. 163). Hence, although both authors share the same stance, namely, that the knower is always situated in a social context, Risner's account substantiates this claim with interview data.

His analysis results in four categories of knowing modes. The emerging theme clusters from the interviews comprise: 'knowing as an interpersonal construction, knowing by doing, knowing as memory, and knowing as certainty' (ibid., p. 161). To emphasize the dynamicity of these aspects, he describes them as 'clusters of ideas which spiral around [those] (…) themes' (ibid.).

According to the author, the dancers' narratives underpin that knowledge is constructed in the interaction with others (*knowing as an interpersonal construction*), and therefore is not the result of one cognizing subject but rather produced by a group (ibid., p. 163). Furthermore, the data 'clearly indicate the epistemological primacy of the body' (ibid., p. 164) which he refers to as *knowing by doing*. His interviewees experience doing primary to the construction of knowing. Concerning *knowing as memory*, he holds that his data affirms 'views of multiple, situated, and contextual knowledges' (ibid.). For example, the music serves as a trigger for memory, body memory plays a role, and the ability to visualize movement is experienced when knowing the dance. The emphasis lies in the view that these ways of remembering spiral around each other which reveals 'the intricate and interrelated epistemological weave' (ibid., p. 166). Finally, for some of the dancers, feeling certain and sure of the dance seems to be crucial for the performance which leaves the author posing questions about the importance of *knowing as certainty*. He concludes that his investigation of the choreographic process reveals 'the composite design of knowledge construction, a spiralling process of the social, the self, body memory, and the relationships formed' (ibid., p. 167).

3.2 Points of consideration

Although both authors come up with interesting notions arguing for an epistemology that includes the dynamicity of knowing processes and the constitutive role of the knower, I find there to be some inconsistencies in their attempts. This is necessary to determine the pitfalls of this project as well as to elucidate possible strategies to circumvent those pitfalls. At the same time, I would like to highlight indicative aspects that are pointing the way forward to an epistemology of contemporary dance.

Let us first consider the theoretical approach. As stated above, Parviainen (2002) draws on feminist critique to argue against traditional epistemology. However, even though she acknowledges the multiple dimensions of relations a subject entertains with its environment (see quote above), she does not seek to integrate this aspect in her inquiry of dance knowledge. While she aims at clarifying the often intuitively used and not yet well-defined notion of bodily knowledge (ibid., pp. 13-14), she does not reserve space for the situatedness of the knower nor for the environment that she introduces so well in the beginning. I agree with her approach that to investigate dance knowledge, one must address bodily knowledge apart from dance knowledge, especially when it comes to the artform of contemporary dance. However, her analysis remains too strongly focused on the bodily subject and its individual knowledge considering the fact that she introduces a concept of knowledge informed by autopoiesis theory as she quotes Krogh and Roos (1995):

> Knowledge enables us to perceive, act, and move in a world, and as we act, perceive, and move, the world comes forth as a result of our actions and observations. (cited in Parviainen, 2002, p. 13)

Autopoiesis theory is a constitutive topic in enactivism which I will elaborate on in chapter 4.2. For me, the lesson learned here is it is indicative that she presents these notions, but it is necessary to integrate them in further analyses. The reason for this inconsistency is the number of different sources she attempts to integrate in her framework. On the one hand, this approach shows that an epistemology of dance needs an interdisciplinary perspective; on the other hand, such an attempt might fail and result in eclecticism. What her article also shows is that a mere descriptive theoretical account is insufficient which in turn reveals the strength of Risner's use of qualitative data.

Let me give an example of Parviainen's argumentation. She explicitly distinguishes bodily knowledge from the Rylean notion of knowing-how as well as articulated knowledge from the Rylean knowing-that, pointing out that the Rylean categories are subsets of the other sets of

knowledges and in doing so striving for a nuanced notion of dance knowledge. However, she concludes with the statement that 'articulated knowledge and bodily knowledge of dance […] are usually interwoven' (ibid., p. 22). While all these statements are certainly not false and besides well supported with her descriptive account of how a dancer learns, the argument is confusing.

What Risner's empirical approach accomplishes instead, is to reveal the nature of knowing as it shows up in human experience in a bottom-up fashion. The methodological choice for the qualitative interpretive inquiry is, as far as I can judge, similar to methods deployed in the field of neurophenomenology that acquire first-person data for the same reason - the interest in human experience. This is an important shift as it resets the standpoint from which a scientific question is asked and investigated. As I shall point out in chapter 4.3, this essential step has been made in cognitive science too.

However, even though I value his conclusions on the nature of knowledge hinting towards a direction productive for this thesis, his analytical framing lacks convincing buttress. For example, when he concludes that the narratives of the dancers 'reassemble the Western duality of body and mind as a unified site for knowledge-construction' (ibid., p. 169), the theoretical arguments are too weak to really deconstruct the mind-body-dichotomy in a stringent way. He asserts:

> These ways of knowing, or epistemologies, as evidenced by the dancers' stories, are often rooted in the experience of the whole body and frequently conjoin knowing that and knowing how. Put more simply, their stories of knowing commence from an epistemic stance, or place of knowing that often combines theory and practice and frequently transcends traditional epistemology altogether (ibid., p. 157).

I certainly agree with the content of this quote, but what I criticize is that he cannot account for *why* these ways of knowing are the way his qualitative data suggests. His argument lacks a well formulated theoretical explanation of the data. There seems to be a missing link between the data and his interpretations, consequently resulting in premature and under verified conclusions.

3.3 Terminological Issues

Finally, it is very important to be aware of the terminology applied to escape the pitfall of binary distinctions. As Risner (2000) explains his envisioned version of epistemology, he still operates within a binary conceptualization of knowing:

> It is an epistemology that combines knowing that and knowing how, a way of constructing knowledge from theory and practice, propositional and practical knowledge that re-integrates the mind and the body (ibid., p. 165).

Such expressions, like "reintegrating the mind and the body", imply that there really was a separation between mind and body when in fact, it was a prevalent conceptualization which affected Western perception of human beings and thus had an impact on our lived realities, but I contend whether there ever was a separation. Terms like reintegrating or reassembling mind and body thus confirms the dualism Risner (2000) strives to overcome. The same critique applies for Parviainen (see the example above) where she presents concepts of knowledge that still comply with dualistic categorizations (bodily/articulated knowledge, knowing how/knowing that).

Thus, even though both authors are contesting traditional epistemology with its binary distinctions, both nevertheless remain reaffirming dualistic categorizations they actually argue against. We can thus find that just as in the discourse on the relation between dance and knowledge, the adopted terminology is often vague or misleading. This does not drive the discourse any further.

Let me finish with a more general remark. As a consequence to the prevalence of logic and abstract thought in traditional philosophy and epistemology, dance scholars now focus on the body. That becomes particularly apparent in the usage of terms such as 'bodily knowledge' (Parviainen, 2002), 'physicalization of knowledge' (Risner, 2000, p. 164), 'physical kind of knowledge' (Klein, 2007, p. 25) and so on. However, this, too, biases our conceptualization of the body. The dance scholars I have presented seem to refer to the physical body, since they are presuming the moving body. However, it is not clearly stated. We have also heard Louppe's concept of the body as a field of interrelations, the body as a network in a particular state. What would such an understanding of the body imply for epistemology? Finally, what is the role of the brain in all this? After all, this organ including the peripheral nervous system is an integral part of the body.

There is another point to the scholarly focus on the body. It seems to leave the mind out of scope. Of course, the singular and sometimes extreme focus on the body is comprehensible in light of the long disregard and neglect in philosophy and the sciences in general. As such, I certainly appreciate this development. However, I believe that it is timely to treat body and mind equally, and presume its unity - not as a reintegration, not as a reunion, but as an intrinsic unity that enables us to live, to (inter)act, and to know. Whereas for dancers this 'embodied thinking is second nature' (Gehm, Husemann and Wilcke, 2007a, p. 16), and therefore not a haunting issue, for cognitive scientists it is an essential topic of investigation. We thus turn to cognitive science to tackle the issues from another angle.

4 Engaging with Cognitive Science

Cognitive Science is the interdisciplinary study of the mind spanning from the human capacity to cognize to animal cognition and artificial intelligence. Subdisciplines of cognitive science range from psychology, linguistics, neuroscience, and artificial intelligence to philosophy and biological anthropology. Despite its wide scope and therefore quite heterogenous field, the core interest is cognition: what it is, how it works, and how we can model it. Each discipline contributes with its perspective and disciplinary research methods to the project of cognitive science with the aim of synthesizing these perspectives.

> The term *cognitive science* refers not so much to the sum of all these disciplines but to their intersection or converging work on specific problems. In this sense, cognitive science is not a unified field of study like each of the disciplines themselves, but a collaborative effort among researchers working in the various fields. (Friedenberg and Silverman, 2006, p. 2)

Within cognitive science, we can also distinguish between paradigms that differ in their conceptualization of the mind or cognition. The cognitivist account, also referred to as traditional cognitive science, understands cognition in terms of a computational metaphor. As such it is thought of as information processing and symbol manipulation. The connectionist account conceives of the mind as a neural network and models cognition using artificial neural networks programmed on a computer device. Instead of symbol manipulation, the emphasis now lies in perceptual pattern recognition. These accounts have in common that cognition is regarded as computational problem-solving. As such, their models were abstract and disembodied, and were not related to cognition 'in the wild' (Hutchins, 1996).

More recent paradigms can be referred to as embodied cognitive science (Wilson and Foglia, 2017). As such, they criticize the classical conception of cognition as amodal, mental representations of the world. Rather, they hold that cognition deeply depends upon the agent's body and emphasize the role of the interaction with its environment for cognitive processes. In my thesis, I will draw from two distinct branches within embodied cognitive science, marked by two landmarks publications: *Metaphors we live by* first published in 1980 by Lakoff and Johnson, and *The embodied mind* first published in 1991 by Thompson, Varela and Rosch (Wilson and Foglia, 2017). I will refer to the works of Lakoff and Johnson as embodiment theory, and to the latter as enactivism, however, both strands rely on the embodiment thesis.

The aim of this chapter is to extend dance scholarship with approaches stemming from cognitive science - embodiment theory, enactivism, and neuroaesthetics of dance -, while at the same time interweaving and connecting between the approach to knowledge as discussed by dance scholars (see chapter 2 and 3) and the notion cognitive scientists hold regarding knowledge. It is accordingly divided in three subchapters. First, I will introduce the embodiment paradigm as it has been put forward by Lakoff and Johnson. I hypothesize that embodiment theory is a useful source to rethink the relation of body and mind regarding language and meaning. I expect this framework to shed light on some of the problems I have identified in chapter 2 and 3. Second, I will draw on enactivism, introducing the key terms and concepts to then apply enactive social cognition research as an analytical lens for assessing the performance encounter. I contend that live art necessitates a social as well as an aesthetic framework. Moreover, I presume that enactive aesthetics as laid out by Noë (2015) will clarify the questions around knowledge and understanding in contemporary dance. Thirdly, I will zoom in to the neuroaesthetics of dance examining the field in prospect of its possible contributions to an epistemology of contemporary dance. Since neuroaesthetics has received much criticism from the humanities, one might be inclined to assume that neuroscientific studies are incompatible with an envisioned epistemology based on embodiment and enactivism. However, I intend to present recent trends and approaches that possibly deny that assumption.

4.1 Embodiment Theory

Within dance scholarship, the term "embodiment" has become popular in the discourses about modern dance but there is no consensus on what it exactly denotes (Carr, 2013). As to my knowledge, the link between embodiment and cognition has not been an issue in dance scholarship so far. Parviainen (2002) too, recognizes the fact that the concept of bodily knowledge - 'knowing in and through the body' - has not been well analysed or defined (ibid.,

pp. 13-14). Although in phenomenological dance studies, it is well established that 'movement is the mother of all cognition' (ibid., p. 14), it is not yet clear how a 'nonlinguistic and nonpropositional knowing in and through movement' (ibid., p. 15) relates to or even translates into propositional knowledge.

It is exactly this gap that embodiment theory, as put forward by Lakoff and Johnson, addresses. I therefore appeal to this particular line of embodiment because it clearly shows that bodily experience and abstract reasoning are not in opposition to each other. Rather, abstract reasoning and understanding rely on bodily experience. What I refer to as embodiment theory has developed over decades of ongoing research, thus, in the following, I will outline the development of embodiment theory in a chronological order by selected landmarks of its history. Another reason for this historical presentation of embodiment theory is to show that the importance of the body was not obvious at the inception phase. What started off as a linguistic project that was primarily interested in meaning and human understanding, grew successively to an indispensable branch in cognitive science with far-reaching philosophical implications.

However, within cognitive science, the notion "embodied" still is subject to debates as to what it means exactly to speak of embodied cognition (Gallagher, 2017, pp. 26–28; Newen, Bruin and Gallagher, 2018, pp. 4–8). Yet the common ground of different proponents is the embodiment thesis. It holds that cognition is embodied when it is dependent on the physical body of an agent, either in a causal or constitutive manner (Wilson and Foglia, 2017). The different stances within embodied cognitive science are referred to as weak and strong embodied cognition (EC). While embodiment theory as put forward by Lakoff and Johnson is an instance of weak EC, enactivism is an example of strong EC (radical embodiment). While in cognitive science this distinction is utterly relevant, for my purpose, which is advancing the discourse on dance and knowledge, this is of minor importance. Nevertheless, it will become clear how these stances differ as we proceed.

The theories and/or hypotheses that I am going to outline are as follows: 1) Conceptual Metaphor Theory (Lakoff and Johnson, 2003[1980]), 2) Theory of Imagination (Johnson, 1987), 3) Gallese-Lakoff-Hypothesis (Gallese and Lakoff, 2005), and 4) Embodied Meaning Hypothesis (Johnson, 2007). I will summarize the key tenets of embodiment theory and end this subchapter with implications for an epistemology of contemporary dance.

4.1.1 Conceptual Metaphor Theory

In *Metaphors we live by*, first published in 1980, Lakoff and Johnson depart from the hypothesis that metaphor is not merely a decorative aspect found in poetic writings, rather, 'it

is pervasive in everyday life, not just in language, but in thought and action' (Lakoff and Johnson, 2003, p. 3). By collecting and analyzing linguistic evidence, they seek to investigate the human conceptual system on which we rely as we go about our daily activities.

Let me give an example of a conceptual metaphor and its linguistic evidence as presented by Lakoff and Johnson (2003). The conceptual metaphor THEORIES (AND ARGUMENTS) ARE BUILDINGS are substantiated by the following linguistic evidence:

> Is that the *foundation* for your theory? The theory needs more *support*. The argument is *shaky*. We need some more facts or the argument will *fall apart*. We need to *construct* a *strong* argument for that. I haven't figured out yet what the *form* of the argument will be. Here are some more facts to *shore up* the theory. We need to *buttress* the theory with solid arguments. The theory will *stand* or *fall* on the *strength* of that argument. The argument *collapsed*. They *exploded* his latest theory. We will show that theory to be without *foundation*. So far we have put together only the *framework* of the theory. (Lakoff and Johnson, 2003, p. 46, original emphasis)

As we can see from this example, even the scientific use of language is based on metaphorical concepts. As Lakoff and Johnson readily admit in their afterword written in 2003, their first take on metaphorical concepts was mediated by a metaphor too. Their explanation of how we understand sentences such as those listed above was backed up by a metaphor that stems from mathematics. They understood conceptual metaphors as mappings from a source domain to a target domain in which inferences from the sensorimotor domain allows for inferences in abstract domains (Lakoff and Johnson, 2003, p. 244). In the example above, the source domain would be our experiences with buildings which map upon the target domain, namely theories and arguments. Simply put, because we understand that buildings need a solid foundation and a well-constructed framework to keep it from falling apart; and because we know that it should be constructed and buttressed with strong material to avoid collapsing, we can therefore infer that a thoroughly built theory should be like a building - being as incontestable as possible.

However, this example is a case of a complex metaphor.[7] As such, it is culturally grounded in a way of living that includes buildings made of stone and science as a practice to secure knowledge. As the authors reflect in their afterword, many of the examples they had found and analyzed back in 1980, were of this sort (ibid., pp. 254-255) which is why the central role of

[7] In their afterword, they refine their theory by stating that complex metaphors rely on and are composed of primary metaphors, e.g., AFFECTION IS WARMTH (see ibid., pp. 255-257). In their book *Philosophy in the Flesh* (1999), they elaborate on primary metaphors in greater detail (chapters 5 and 6).

the body was not evident. In the beginning it was merely an intuition 'that conceptual metaphors were grounded in bodily experience' (ibid., p. 249). Yet, they already claimed then that our conceptual system was grounded in such a way that the non-physical typically was conceptualized in terms of the physical (ibid., p. 59). Their examples of what they referred to as 'emergent concepts' (ibid., p. 58) already suggest the role of the body in human conceptualizing. Concepts such as CONTAINER, OBJECT and SUBSTANCE emerge directly in and from our bodily experience. Lakoff and Johnson (2003) explain:

> We experience ourselves as entities, separate from the rest of the world - as containers with an inside and an outside. We also experience things external to us as entities - often also as containers with insides and outsides. We experience ourselves as being made up of substances - e.g., flesh and bone - and external objects as being made up of various kinds of substances - wood, stone, metal, etc. We experience many things, through sight and touch, as having distinct boundaries, and, when things have no distinct boundaries, we often project boundaries upon them - conceptualizing them as entities and often as containers (for example, forests, clearings, clouds, etc.). (ibid., p. 58)

They provide three sentence examples which demonstrate how the word "in" activates the concept CONTAINER in three different domains of experience (ibid., p. 59-60):

> Harry is in the kitchen. (spatial concrete concept)
> Harry is in the Elks. (SOCIAL GROUPS ARE CONTAINERS metaphor)
> Harry is in love. (EMOTIONAL STATES ARE CONTAINERS metaphor)

The conceptual metaphor theory can be considered as one of the core elements of embodiment theory. The second core element are image schemata upon which metaphors rest. In the example above, the pertaining image schema would be the CONTAINMENT schema that defines a boundary, which demarcates an interior from an exterior (Johnson, 2007, p. 141, 2017, p. 100). Whereas in the first example, the interior is a concrete space, the other two examples are understood by means of metaphorical spatialization (Lakoff and Johnson, 2003, p. 60). Johnson elaborates on the image-schematic dimension of metaphors in his later works, particularly in his theory of imagination (Johnson, 1987, pp. 65–100).

4.1.2 Theory of Imagination

In Johnson's theory of imagination (1987), which he strikingly refers to as the endeavor of 'putting the body back into the mind' (Johnson, 1987, p. xiv), he 'explores the central role of

human imagination in all meaning, understanding, and reasoning (ibid., p. ix). He contests that imagination is solely at play when it comes to areas of discovery, invention, or creativity; rather, he argues that imagination is essential to the structure and constitution of rationality. Drawing on Kant and extending the Kantian view of imagination with his description and analysis of two primary structures of imagination, he considers imagination as 'a capacity for ordering mental representations into unified, coherent, meaningful wholes that we can understand and reason about' (ibid., p. 194). To map out the no-man's land in which imagination seems to exist (ibid., p. xxix), he seeks to establish a 'geography of human experience' (ibid., p. xxxvii) as he describes two forms of imaginative structure: image schema and metaphor, both arising from patterns of bodily experience.

Although, the role of the body is explicitly addressed here by Johnson, it is important to note that he uses the term "body" 'as a generic term for the embodied origins of imaginative structures of understanding' (ibid., p. xv). As such, they are also '*experiential* structures of meaning' (ibid., p. xvi, original emphasis) that encompass 'basic perceptual, motor-program, emotional, historical, social, and linguistic dimensions' (ibid.). According to Johnson, understanding 'involves many *preconceptual* and *nonpropositional* structures of experience (such as image schemata) that can be metaphorically projected and propositionally elaborated to constitute our network of meanings' (ibid., emphasis added). Let us now proceed with a closer look at image schemata.

Examples for image schemata are CENTER-PERIPHERY, FORCE DYNAMICS, VERTICALITY, BALANCE, SOURCE-PATH-GOAL, SCALARITY and CONTAINMENT (Johnson, 2007, pp. 136-146). Johnson (1987) defines image schema as follows:

> An image schema is a recurring, dynamic pattern of our perceptual interactions and motor programs that gives coherence and structure to our experience. (ibid., p. xiv)

As stated earlier, image schemata are nonpropositional, however, Johnson (1987) argues, image schemata and metaphors are propositional in a special sense as they 'exist as a continuous, analog pattern of experience or understanding, with sufficient internal structure to permit inferences' (ibid., pp. 3-4). They are embodied in that they represent patterns of meaningfully organized experience, such as structures of bodily movement and perceptual interaction (ibid., p. 19). They are abstract in the sense that they organize mental representations on a more general level than when we form concrete mental pictures (ibid., pp. 23-24). Thus, bodily experience – or knowing in and through the body – is not fully nonpropositional as

Parviainen (2002) claims. If image schemata and conceptual metaphors - both imaginative structures that arise from bodily experience - are taken to be propositional in a special sense, then the binary distinction between propositional and nonpropositional does not pertain any longer. If this is true, then there exists a connection of bodily experience and abstract understanding in that realm of imagination as Johnson will argue later.

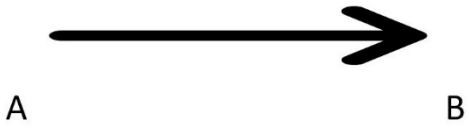

Figure 1: SOURCE-PATH-GOAL Schema
Note that this is just a visual representation of the structure. Image schemata are dynamic patterns, not static images.

Image schemata consist of simple structures, composed of parts that stand in relation to each other (ibid., p. 28). For example, the SOURCE-PATH-GOAL schema consists of three elements: Source (indicated as A), Goal (indicated as B), and the path (indicated as a vector between A and B). Additionally, it consists of one relation, namely the path from A to B (which is why it also referred to as FROM-TO schema) indicated by a force vector pointing from A to B. This schema is a recurrent pattern that we can recognize in various concrete events of different sorts. Johnson (1987) gives the following examples:

> (a) walking from one place to another, (b) throwing a baseball to your sister, (c) punching your brother, (d) giving your mother a present, (e) the melting of ice into water. (ibid., p. 28)

We can see that all these events share the same basic parts and relations as defined above. However, note that in the last example, source and goal represent states of a substance, and must therefore be interpreted metaphorically.

Johnson (1987) goes on explaining that he conceives of schema 'as a *continuous structure of an organizing activity*' (ibid., p. 29) that is necessary for us to have meaningful experiences. He continues by stating that they are 'the primary means by which we *construct* or *constitute* order (…)' (ibid., p. 30). Besides having parts and relations, image schemata also have an

internal structure that functions as preconceptual gestalts that not only enable metaphorical extensions, but also constrain metaphorical mappings and meaning (ibid., pp. 41-42). Johnson conceives of gestalt structures as 'an organized, unified whole within our experience and understanding that manifests a repeatable pattern or structure' (ibid., p. 44). As such, they generate coherence and unity in our network of meaning (ibid., p. 41).

I do not intend to review Johnson's in-depth-analysis, mainly because it is linguistic and therefore not relevant for my purpose. What I do intend with this subchapter is to highlight the importance of image schemata and their metaphorical projections as embodied imaginative structures that play a central role in understanding, meaning, and reasoning. In Johnson's (1987) words:

> Imagination, in this sense, mediates between sense perception and our more abstractive conceptualizing capacities; it makes it possible for us to conceptualize various structural aspects of our experience and to formulate propositional descriptions of them. (ibid., p. 194)

Imagination is also at the heart of somatic methods as a way to reconceptualize movements, bodily experiences, and habitual patterns. Ideokinesis, for example, rests on this sort of applied imagination. As such, it is no surprise that to dancers 'embodied thinking' is a familiar mode. However, this nonpropositional awareness of the body is verbally guided by propositions that address those imaginative capacities. Applying these capacities of imagination is what Louppe (2009) refers to as she states that the body thinks and brings forth sense (ibid., p. 67). She claims that contemporary dance has overcome traditional mind-body dualisms, and this is certainly true for the practices of contemporary dance (ibid.). Yet, the scholarly discourse on dance and knowledge has shown that the dualism still pertains in the epistemological discussion about dance. Let us proceed by drawing on convincing neuroscientific evidence for embodied understanding to tackle the question at hand.

4.1.3 Gallese-Lakoff Embodiment Hypothesis

In the following, I will turn to the topic of how embodied understanding is realized neurally; hence, we will now engage with neuroscience which - at least partially - substantiates embodiment theory (Johnson, 2007, p. 168). The Gallese-Lakoff embodiment hypothesis (ibid., p. 162) is based on the reuse principle which holds that 'neural circuits originally established for one use can be reused or redeployed for other purposes while still maintaining their original function' (Gallagher, 2017). In their paper *The Brain's concepts*, Gallese and Lakoff (2005)

explore the role of the sensory-motor system in conceptual knowledge. They argue that 'conceptual knowledge is embodied, that is, it is mapped within our sensory-motor system' (ibid., p. 457). Drawing on a major finding in neuroscience, namely that 'imagining and doing use a shared neural substrate' (ibid.), they claim that the same neural substrate that is used for imagining, is also used for understanding. Hence, '*understanding is imagination*' (ibid., original emphasis). This is made possible by neural exploitation which they understand as 'the adaptation of sensory-motor brain mechanisms to serve new roles in reason and language, while retaining their original functions as well' (ibid.). They aim at providing 'a testable embodied theory of concepts […] capable of reconciling both concrete and abstract concepts within a unified framework' (ibid., p. 458). By considering studies from neuroscience, neural computation, and cognitive linguistics (ibid.), they conclude that 'rational thought is an exploitation of the normal operations of our brain' (ibid., p. 474).

To establish their claim, they start out with looking at how actions are implemented in the brain first, in a second step they focus on action concepts – they exemplify their theory on the action of grasping. The authors claim that actions such as grasping are multimodal (ibid., p. 460). This means that,

> '(1) it is neurally enacted using neural substrates used for both action and perception, and (2) that the modalities of action and perception are integrated at the level of the sensory-motor system itself and not via higher association areas.' (ibid.)

This is important since multimodality stands in contrast to what has been termed supramodality which is in line with a modular approach to brain functions. It therefore assumes that there exist separate modules for action and perception in the brain which rely on association areas in order to integrate information. According to the authors, multimodal integration is the norm which implies that there are no pure association areas. Rather, multimodal integration meets the task that association areas were believed to carry out. This results in assuming that the different sensory modalities are not only integrated amongst each other, but also integrated with motor control and planning (ibid., p. 459). Drawing on neuroscientific research they state:

> Cortical premotor areas are endowed with sensory properties. They contain neurons that respond to visual, somatosensory, and auditory stimuli. Posterior parietal areas, traditionally considered to process and associate purely sensory information, in fact play a major role in motor control. The premotor and parietal areas, rather than having separate and independent functions, are neurally integrated not only to control action, but also to serve the function of constructing an integrated

representation of (1) actions together with (2) objects acted on and (3) locations toward which actions are directed. (ibid., pp. 460-461)

For the action of grasping, this means that it consists of various components: the motor component, various perceptual components, and somatosensory components. In concrete, these components denote what one does in grasping, what a graspable object looks like, how it looks when somebody grasps, and what it feels like to grasp (ibid., p. 458). The authors illustrate this cross-modal connectivity by drawing on research on monkeys that also set a strong case for embodied simulation (see also Johnson, 2017, p. 161). They discuss functional clusters and how their functional mechanisms serve simulation. Within those clusters, there are special neurons that are of major importance for simulation: action-location neurons, canonical neurons, and mirror neurons (Gallese and Lakoff, 2005, pp. 460–463). For my purpose, however, I will focus on the role of these neurons for embodied simulation considering evidence from human studies which Gallese and Lakoff present.

Why is simulation important in this argumentation? The authors explain that in order to understand the meaning of the concept *grasp*, one must be able to imagine oneself or another person grasping an object (ibid., p. 458). In neuroscientific terms, imagination is mental simulation (ibid.), and as I have cited the authors earlier, understanding is imagination. Therefore, neurally spoken, it follows that understanding requires simulation (ibid., p. 468).

According to the authors, there is evidence for simulation in so-called action-location neurons. These neurons belong to a functional cluster that is activated when a subject hears or sees an object being moved in her peripersonal space. The interesting aspect of this study by Bremmer *et al.* (2001) is that this cluster is located in the premotor cortex, a brain area that is thought to control movements in the peripersonal space. Gallese and Lakoff interpret this activation as an action simulation that a) proves multimodal integration, and b) the given stimulus triggers a plan for potential motor action because of the sensory integration. Hence, this activation is a '*simulation of potential action'* (ibid., p. 460, emphasis added) and uses the same neural substrate as the action itself would.

There is also evidence for embodied simulation found in canonical neurons which, in the case of monkeys, have the property of firing not only when a grasping action is carried out but also when the subject perceives an object that it could grasp but does not (ibid., p. 461). In humans, several brain-imaging studies have shown that when subjects had to observe, name silently, and imagine using various tools like a hammer or a screwdriver, the ventral premotor

cortex was activated which is also activated when performing actions with these tools (see ibid., p. 463).

Finally, several studies prove that there is a mirror system in humans comparable to the mirror neurons in monkeys. The relevant aspect is that brain-imaging studies have shown that there is an activation of the premotor and parietal areas during action observation. The explanation again is that when a subject observes action carried out by another subject, then it simulates this action. Since simulation uses the same neural substrate as performing an action, it becomes clear why there is an activation found in premotor and parietal areas.

As the authors have stated: understanding is imagination. When it comes to mental imagery - both visual and motor imagery - it has been sufficiently proven by a myriad of studies that these, too, are embodied. In fact, these are very clear examples of embodied simulation, since the bottom line of these studies suggest that some of the brain areas used in seeing or moving are the very same areas used for imagining a visual scene or movement (ibid., pp. 463-464). Visual and motor imagery hence can be performed by using the sensory-motor system. The authors conclude that 'imagination is not separate in the brain from perception and action' (ibid., p. 464).

On the example of grasping, the authors show how an action concept is neurally characterized in the sensory-motor system. However, they prefer referring to the concept as schema as the term "concept" bears traditional connotation as being amodal, disembodied and symbolic whereas 'schemas run bodies' (ibid., p. 468). In their definition an embodied concept is best thought of as a schema that is characterized by its parameters and its values. Johnson (2007) defines parameters as follows:

> Parameters are higher-level features of neural organization of the sensorimotor system, characterizing such things as the force with which an action is done, the direction of the action, the objects acted upon, the phase of the action (e.g., initial state, central phase, ending phase, final state), and the agent performing the action. Different functional clusters of neurons work together to realize different neural parameters, so one functional cluster might be responsible for the force of the action, another for its direction, and a third for its goal. When you combine all of the relevant parameters for a type of action and specify the particular values for each parameter relative to a particular action, you have the schema for that action. (ibid., p. 162)

While parameters are fixed and stable because they are built into our neural structure, actions and simulations are dynamic and adaptable to the context (Gallese and Lakoff, 2005, p. 465). Thus, parameters like action, force, or direction are *neurally* fixed, while their values

e.g., degree of force, are affected by the given (imagined) situation (ibid.). For action as well as for simulation, this means that they are governed by parameter values (ibid.). Gallese and Lakoff (2005) present the structure of the schema for the concept grasp:

> The grasp schema.
> 1. The role parameters: agent, object, object location, and the action itself.
> 2. The phase parameters: initial condition, starting phase, central phase, purpose condition, ending phase, final state.
> 3. The manner parameter.
> 4. The parameter values (and constraints on them).
>
> The various parameters can be described as follows:
>
> Agent: An individual.
> Object: A physical entity with parameters: size, shape, mass, degree of fragility, and so on.
> Initial condition:: Object Location: Within peri-personal space.
> Starting phase:: Reaching, with direction: Toward object location; opening effector.
> Central phase:: Closing effector, with force: A function of fragility and mass.
> Purpose condition:: Effector encloses object, with manner (a grip determined by parameter values and situational conditions).
> Final state:: Agent in-control-of object. (ibid., p. 467)

The authors emphasize that this schema is structured by neural parameters and their values, thus, the reader has to keep in mind that every parameter and value noted above stands for a functional cluster which is merely named symbolically, that is, with a verbal description (ibid.).

What Gallese and Lakoff provide is ‘a reasonably detailed neural theory for one action concept - grasping’ (ibid., p. 468). The merit of their proposal is to demonstrate ‘how the sensory-motor system can characterize a sensory-motor concept, not just an action or a perception, but a concept with all that that requires’ (ibid.). They believe that this could be the case for all concrete concepts (ibid., p. 469) and conclude:

> According to our hypothesis, understanding requires simulation. The understanding of concrete concepts - physical actions, physical objects, and so on - requires sensory-motor simulation. But sensory-motor simulation, as suggested by contemporary neuroscience, is carried out by the sensory-motor system of the brain. It follows that the sensory-motor system is required for understanding at least concrete concepts. (ibid., p. 468)

As Johnson (2007) rightly notes, it seems not so 'surprising that concrete concepts operate via the sensorimotor areas of the brain' (ibid., p. 165). However, he acknowledges that 'Gallese and Lakoff are able to raise a strong objection to any disembodied view of concepts' (ibid., p. 164). But how exactly then does the Gallese-Lakoff hypothesis of embodied concepts tie in with the 'embodiment of abstract concepts' (ibid., p. 165)? In what way does this hypothesis substantiate embodiment theory?

More importantly, what does it add to our question of knowledge and dance? If understanding is imagination that requires sensory-motor simulation, what does this finding mean for a dancer's practice? Dancers know that for performing a certain movement, it is helpful to have a clear image of the movement in mind. They exploit imagination for learning movement and accurate motor performance. When studying a new choreography, dancers often "mark" the movement sequences. This means that they do not fully dance; rather, they go through the motions with their imagination. The same holds for somatic methods. For example, verbal guidance is used to induce the visualization of the skeletal structure of the body which leads to an enhanced awareness and better alignment of posture. Another example would be that dancers know how to enhance their presence just by imagining filling the space with their presence. Thus, I would conclude that imagination is an indispensable aspect of dance knowledge which has not been mentioned so far. The insight that imagination is not separate from perception and action could be an explanation of why applying imagination results in felt concrete outcomes such as sketched out above.

4.1.4 Embodied Meaning Hypothesis

Let us continue with Johnson's development of the embodied meaning hypothesis. In *The meaning of the body* (2007) Johnson puts emphasis on the 'deep, visceral origins of meaning' (Johnson, 2007, p. x) to not only substantiate the central role our bodily experiences play for our capacity of meaning-making, but to emphasize that linguistic meaning is just one special case of meaning in general. Johnson (2007) now claims:

> To discover how meaning works, we should turn first to gesture, social interaction, ritual, and art, and only later to linguistic communication. (ibid., p. 208)

Thus, looking at the development of embodiment theory, we can see that it is only later that the central role of the body is explicitly addressed and argued for (Johnson, 1987, 2007, 2015,

2017; Lakoff and Johnson, 1999). It is also interesting to note, that whereas earlier works depend for a great part on analysis of linguistic evidence (Johnson, 1987; Lakoff and Johnson, 1999, 2003), more recent investigations draw on neuroscientific evidence (Johnson, 2007, 2015, 2017) and discuss non-linguistic domains of meaning-making such as arts and music (Johnson, 2007).

In discussing the corporeal roots of symbolic meaning, Johnson (2007) states that

> the problem for an embodied view of cognition is to explain our marvelous human feats of meaning-making, abstraction, reasoning, and symbolic interaction, but without positing an ontological rupture […] between human "bodily" and "mental" processes. The question is, How can meaning emerge in our bodily experience (i.e., in sensorimotor activity) and still be the basis for abstract thought? (ibid., pp. 135-136)

He argues that in order to establish an ontological continuity, we have to consider the interactive coordination of a human organism with its environment (ibid., p. 136). He refers to these recurring, adaptive patterns of organism-environment-interaction as structural coupling[8]. They allow organisms to survive and are also the ground of meaning (ibid.). According to Johnson, 'image schemas are precisely these basic structures of sensorimotor experience by which we encounter a world that we can understand and act within' (ibid.). I have discussed image schemas earlier, however, in the light of enactivism and its insights concerning the environment he now includes, the definitions change substantially. Since they are crucial in setting out an ontological framework for embodiment theory (ibid., p. 145), I would like to take a second look at the redefinition of image schemas.

Johnson (2007) now defines them as 'a dynamic, recurring pattern of organism-environment-interactions' (ibid., p. 136). These recurrent, stable structures and patterns are meaningful as they arise from interacting with the environment (ibid., p. 144). Image schemata are not mental or bodily (ibid., p. 139); they "bind" body and mind (ibid., p. 145). Only with this assumption is it possible to infer that image schemas are structures of sensorimotor experience that are recruited for abstract reasoning (ibid., p. 141). He now adds that humans 'have neural mechanisms for metaphorically extending image schemas as we perform abstract conceptualization and reasoning' (ibid.). He concludes:

[8] This term is borrowed from enactivism, however, Johnson's notion differs from the enactive concept. He regards image schemata as a basic kind of structural coupling (ibid., 136)

> Image schemas constitute a preverbal and mostly nonconscious, emergent level of meaning. They are patterns instantiated in the topologic neural maps […]. Although they are preverbal, they play a major role in the syntax, semantics, and pragmatics of natural language. They lie at the heart of meaning, and they underlie language, abstract reasoning, and all forms of symbolic interaction. (ibid., pp. 144-145)

He is now explicit over the role of image schemata as pertaining to the body and the mind. Thus, as preverbal image schemata lie at the heart of language, then bodily knowledge cannot be longer put in a mutually excluding opposition to discursive knowledge.

Let us return to the question posed earlier: can all concepts - concrete as well as abstract ones - be grounded in sensorimotor experience (ibid., p. 157)? Remember, the Gallese-Lakoff hypothesis suggests that all concrete concepts are realized in the sensorimotor area of the brain. Drawing on Gallese and Lakoff (2005) and the conceptual metaphor theory, Johnson asserts:

> The embodied meaning hypothesis proposes that when we conceptualize acts of understanding via the UNDERSTANDING IS GRASPING metaphor, we are activating the grasp schema described by Gallese and Lakoff. It is this activated schema that permits us to reason and draw inferences about what it means to understand an idea, sentence, or theory. All of the internal structure of the grasp schema is made available for making sense of acts of understanding. (ibid., p. 166)

The example below illustrates that the internal structure of the grasp schema is also the source-domain logic (or inferential structure) for this conceptual metaphor (ibid.): if we successfully grasp an object physically, we infer in the abstract domain that to grasp an idea means to understand it. If we do not get it (as we would informally claim), we refer to that conceptual metaphor claiming that an object (the idea) is out of reach for us.

UNDERSTANDING IS GRASPING

Source domain (grasping)		*Target domain (understanding)*
Object Grasped	→	Idea/Concept Understood
Grasping An Object	→	Understanding An Idea
Strength Of Grip	→	Depth Of Understanding
Losing One's Grip	→	Failing To Understand
Object Out Of Reach	→	Idea That Cannot Be Understood

Figure 2: Conceptual metaphor example 1 (Johnson, 2007, p. 203)

Let us look at another metaphor for understanding: UNDERSTANDING IS SEEING. Johnson assumes that the source domain of the conceptual metaphor, which in this case is vision, activates the visual system and the inferential structure of the source domain (ibid., p. 165). Thus, being able to see an object, means to understand something, which we would often indicate by stating "I see". Johnson explains that the 'inferences are carried out via the source-domain activations, and then they carry over into the target domain via the source-to-target mappings' (ibid., p. 166).

UNDERSTANDING IS SEEING

Source domain (vision)		*Target domain (understanding)*
Object Seen	→	Idea/Concept
Seeing An Object Clearly	→	Understanding An Idea
Person Who Sees	→	Person Who Understands
Light	→	"Light" Of Reason
Visual Focusing	→	Mental Attention
Visual Acuity	→	Mental Acuity
Physical Viewpoint	→	Mental Perspective

Figure 3: Conceptual metaphor example 2 (Johnson, 2007, p. 203)

In this actualized version of the conceptual metaphor theory, the term mapping can be understood as conceptual or neural. While conceptual mapping 'refers to the correlation of items and relations in the conceptual source domain with structure in the target domain' (ibid.), neural mapping 'refers to patterns and neural connections between and among various functional parts of the brain' (ibid.). Johnson hypothesizes that 'neural mapping is the basis for the conceptual mapping that constitutes a conceptual metaphor' (ibid., p. 167). This would imply that we would 'use our sensorimotor neural circuitry for abstract reasoning, via metaphorical mapping structures' (ibid.). Even if this cannot be fully proven yet as it still awaits to be substantiated by neuroscientific investigations (ibid., p. 168), I consider the evidence as convincing.

4.1.5 Key Tenets of Embodiment Theory

Embodiment theory provides the premises on which an epistemology of contemporary dance can be built upon. One basic premise is that body-mind is one functional unity. According to Johnson (2007) the Cartesian dichotomy is an error that leads to problematic conclusions of the sort we have already encountered in the discourse on dance and knowledge. Therefore, this premise is of utmost importance for establishing a ground for an epistemology that accounts for

dance. While many dance scholars draw on phenomenology to solve this tension, Johnson draws on American pragmatist philosophy, especially Dewey. To capture the continuity between the "bodily" and the "mental", he uses Dewey's term *body-mind*. Body and mind in this account 'are not two separate and ontologically distinct entities' (ibid., p. 274); rather, they are 'aspects or abstractable dimensions' of an interactive process (ibid.). Johnson puts it bluntly:

> The grounding assumption of the embodied cognition view is that Humpty-Dumpty was never broken, so there is no need to try to put him back together. (Johnson, 2007, p. 145)

Thus, by using these terms we are pointing at certain dimensions of an interactive process. How are these defined then? What is meant then with the term "body"? As I have indicated above, in his earlier work Johnson uses the term body 'as a generic term for the embodied origins of imaginative structures of understanding, such as image schemata and their metaphorical elaborations' (Johnson, 1987, p. xv). In acknowledging the 'deep, visceral origins of meaning' (Johnson, 2007, p. x) he also recognizes the multidimensionality of the body. An embodied account of meaning and mind requires 'multiple, nonreductive levels of explanation' (ibid., p. 275) along those various dimensions of the body. Hence, the biological, the ecological, the phenomenological, the social and the cultural body make up 'the' body. Any reduction to one of these dimensions simply cannot account for the complexity of human nature (ibid.). Johnson (2007) explains:

> However, *the reduction of the body to the mere physical organism is just as misguided as the opposite error of claiming that the body is nothing but a cultural construction.* They are both reductions; the first leaves out large parts of what makes meaning and mind possible, and the second leaves out many of the sources of, and constraints on, meaning and mind that come from the character of our corporeal rootedness in the biological-ecological processes of life. (ibid., p. 276, original emphasis)

Let us now turn to the other dimension of a human organism's interactive process with its environment: the mind. A 'nondualistic, naturalistic conception of the mind' (ibid., p. 208) is key for embodiment theory. However, naturalistic does not mean that the mind is equated with the brain. As Johnson (2007) puts it:

> […] the proper locus of mind is a complex, multilevel, continually interactive process that involves all of the following: a brain, operating in and for a living, purposive body, in continual engagement with complex environments that are not just physical but social and cultural as well. (ibid., p. 175)

Our brains operate as an organic part of our functioning bodies (ibid., p. 1), but mind *emerges* from the physical, social, and cultural interaction we engage with. It is not a pre-given faculty; mind is an achievement. We acquire minds as we develop our primitive cognitive capacities in infancy into fully formed functioning minds of adulthood. Thus, mind is not static either, it is a matter of degree (ibid., pp. 151-152).

4.1.6 Implications for an Epistemology of Contemporary Dance

The embodied view of cognition has major philosophical implications, and Lakoff and Johnson repeatedly and consistently keep pointing this out throughout all their monographs and related articles (Johnson, 1987, 2007, 2015, 2017; Lakoff and Johnson, 1999, 2003). In the following, I will give a short summary of their critique on objectivism, subjectivism, and representationalism as it sheds light on why the discourse on dance and knowledge got stuck. I will argue that the barrier was an unconscious adoption of a set of recurrent dualisms that are typical for the Western philosophical tradition. In the following, I will focus on commonalities of observations and conclusions of dance scholars and cognitive scientists of the embodied line of thought as both parties faced the same challenges.

In *Metaphors we live by*, Lakoff and Johnson (2003) locate their approach of meaning roughly speaking between objectivism and subjectivism with overlaps on both ends. They refer to their stance as an *experientialist synthesis* which rejects 'the objectivist obsession with absolute truth' and 'the subjectivist insistence that imagination is totally unrestricted' (ibid., p. 228). In Johnson's later works, however, he clearly argues against objectivist accounts of meaning that spring historically from Descartes and Kant:

> The central moral of this brief story is that certain Cartesian and Kantian themes have reinforced a recurring set of ontological, epistemological, and logical dichotomies that are profoundly influential on Western ways of thinking; […] (Johnson, 1987, p. xxix)

This dichotomy has also been the reason for the neglect of dance within philosophy. Another common point of critique concerns the non-existence of the human subject. Just like Parviainen (2002) and Risner (2000) criticize that in traditional epistemology the subject is not considered at all, Johnson's diagnosis of objectivist accounts of meaning runs along the same line:

> There is nothing about human beings mentioned anywhere in this account - neither their capacity to understand nor their imaginative activity nor their nature as functioning organisms nor anything else. (Johnson, 1987, p. x)

This blind spot stems from putting truth conditions of propositions into focus. It follows that if the knowing subject is ignored, that the body, hence, the knowing or understanding organism, becomes unattainable too. As a result, disembodied views of the mind and an epistemology that focuses on sentential truth have evolved with supreme influential impact on our conceptualization of mind, also within the sciences. Johnson (2007) states:

> What follows from this is that the philosophies of mind and theories of knowledge that are based on these versions of analytic philosophy of language inherit (and then reinforce) all of the *ontological and epistemological dualisms (e.g., mind/body, cognitive/emotive, fact/value, knowledge/imagination)* that give us a picture of human thought as cut off from the world, thereby requiring criteria for determining whether and how sentences can be connected to things in the world. (ibid., pp. 271-272, emphasis added)

It is exactly these epistemological dualisms that are reproduced in the dance knowledge discourse. As I have commented earlier, despite the many interesting proposals that have been put forward in characterizing dance knowledge, the gap between body and mind remained at the basis of those proposals. I can only assume that this has led to the discontinuation of the discourse. Johnson (1987) describes the gap poignantly:

> Roughly, the gap is thought to exist between our cognitive, conceptual, formal, or rational side in contrast with our bodily, perceptual, material, and emotional side. The most significant consequence of this split is that all meaning, logical connection, conceptualization, and reasoning are aligned with the mental or rational dimension, while perception, imagination, and feeling are aligned with the bodily dimension. (ibid., p. xxv)

With adopting the basic premise of embodiment theory, all (reproduced) separation lines between affective, physical, discursive, (non-)propositional and experiential knowledge can be discarded. Moreover, the definition of body and mind in embodiment theory minimize dualistic categories from entering the discussion or analysis while acknowledging that characterizations regarding knowledge or the body point out different dimensions within that body-mind unity and its interactive process with the environment.

The main point, however, is that dance knowledge - whether labelled as experiential, bodily, or nonpropositional – should not be positioned in opposition to discursive, propositional, or abstract knowledge. Conceptual metaphor theory and the notion of image schemata clearly demonstrate the dependence of abstract thought on bodily experience. Experiential, preverbal knowledge, thus, can be now characterized as dynamic, recurrent sensorimotor patterns of organism-environment-interactions that are instantiated in topological neural maps. These sensorimotor neural circuits can be redeployed for understanding concrete as well as abstract concepts. As such bodily knowledge or nonpropositional awareness are at the basis for our use of language.

I would like to finish this subchapter with a quote from Johnson (2017). In pondering on a theory of embodied knowledge, he gives a definition for knowledge which serves an epistemology of dance well:

> Knowledge is embodied, fallible, and perspectival. Like everything else human beings do, knowing is situated, value laden, and action oriented. The constraints on what we can know and how we know it come from the body-based processes of perception, bodily movement, and emotional response that make us who and what we are. Knowing is thus an activity - an activity in which experience is transformed by inquiry - and it is judged by how well it allows us to move forward in our lives, to integrate complex situations, to act within them to enhance meaning, to free up energies for new undertakings, to solve problems, and to harmonize conflicting values and ends. Knowing is about learning the meaning of things and realizing this meaning in our attitudes and actions. Cognition is learning carried on over the course of our lives, and so our understanding and self-identity are always subject to reconstruction as we experience new things and situations. To mistakenly conceive of knowledge as ever being fixed or complete is to miss the ever-changing character of experience, which never ceases to call for reconsideration, critical analysis, and imaginative planning for action. (ibid., pp. 222-223)

Thus, unlike Klein (2007) who proposes a physical theory of knowledge, I suggest pursuing a theory of embodied knowledge that could also account for body/dance knowledge in contemporary dance. However, the presented embodiment theory can only account for what dancers know and has little to say about how this knowledge is shared in a performance encounter. We therefore turn to a biological theory of understanding - the so-called enactive approach.

4.2 Enactive Social Cognition Research

As we have seen in the earlier chapter, Johnson argues against a dualistic account of mind and body which most strikingly reveals itself in the observation that in objectivist's accounts of meaning human beings are simply omitted (Johnson 1987, p. x). The enactive approach arose out of a similar concern. In *The Embodied Mind* - first published in 1991 - Varela, Thompson & Rosch assess cognitive science and come to the conclusion that it 'has had virtually nothing to say about what it means to be human in everyday, lived situations' (Varela, Thompson and Rosch, 2016, p. lxi). Their aim is to integrate the study of human experience and to emphasize its relevance in the study of the human mind because they realized that 'the power and sophistication of contemporary cognitive science could generate *a divided scientific culture in which our scientific conceptions of life and mind* […] *and our everyday, lived self-understanding* […] *become irreconciliable*. (ibid., p. lxvi, emphasis added). The initial steps of the enactive approach were aiming for 1) recovering 'commonsense knowledge' (ibid., p. 147) - not just regard it as an epiphenomenon of rationality; and 2) opening up a space of communication and mutual illumination between phenomenology, cognitive science and Buddhist philosophy and mindfulness practices.

Thompson (2007), who has been a driving force of formulating the enactive theory, identifies another objective addressing the so-called explanatory gap[9]. In a nutshell, the explanatory gap refers to the problem of explaining how biological processes can account for phenomenal experiences. The intention of the author is not to close the gap; rather, he aims at providing a variety of philosophical and scientific resources for widening the possibilities of how to think about this issue (ibid., p. x).

The main resources for the envisioned 'circulation between the sciences of the mind (cognitive science) and human experience' of the seminal work by Varela, Thompson & Rosch (2016, p. lxi) were the three fields mentioned above. Yet, Thompson (2007) mainly draws on 'phenomenological analyses of human experience and scientific analyses of life and mind' (ibid., p. x)[10]. He acknowledges the phenomenological method of investigation, known as phenomenological reduction or epoché, as a comparable practical method to meditation practices.

[9] The term has been coined by philosopher Joseph Levine in 1983 and has been further elaborated on by David Chalmers known as the hard problem of consciousness.

[10] I specifically mention these two books as I consider them particularly appealing to dancers familiar with meditative practices and dance scholars already familiar with phenomenology. Moreover, phenomenologists like Shaun Gallagher and Dan Zahavi have played an active role in bringing phenomenology to bear in the field of cognitive science.

Hence, the enactive approach is not merely a theoretical endeavor that seeks to investigate human experience. Notably, *The Embodied Mind* exhibits a proximity to what I regard as the core element of contemporary dance, namely, the gesture of redirecting one's attention[11] in somatics-informed dance practices. The authors recognize transformation as inherent to human experience which can be fostered by mindfulness practices. The distinction between phase 1 and phase 2 enaction differentiates between: a state of mind that is absorbed by life (phase 1) and a mode of knowing in which the mind is simply present (phase 2) (Varela, Thompson and Rosch, 2016, pp. xxxviii–xli). It is in this state of presence (phase 2) in which transformation can occur, and it is the source for the transformative effect of contemporary dance as pointed out by Klein (2007, p. 32). By treating mindfulness as a serious domain of human experience (not as an object of research as it has been the trend in cognitive psychology), I consider this work particularly appealing to dancers since it has also been well-received in the arts and humanities, as well as in somatics and bodywork (Varela, Thompson and Rosch, 2016, p. xxii).

In this subchapter I want to point to the informative ways in which enactive theory offers descriptions of a performance encounter. While I will be giving a short explanatory overview of the key notions in the following, I intend to center this subchapter around subsequent work in the field of social cognition that discusses intersubjectivity in an enactive framework (De Jaegher and Di Paolo, 2007; Fuchs and De Jaegher, 2009). Since dance is a live art, it is feasible to discuss a performance encounter in terms of a social situation, rather than merely conceiving it in terms of aesthetics wherein an audience observes kinetic art. Framing it in this manner also satisfies the notions proposed by Brandstetter (2007) and Risner (2000). If a performance is regarded as shared knowledge between individuals, this demands the acknowledgment of the social aspect of knowing. It also is in line with Louppe's (2009) proposal to think of a dance performance as a dialog and Nancy's (2006) essay on the experience of a performance encounter. Their descriptions of the perceptual processes during a performance resemble the enactive description of social cognition and interaction processes as I will present later. In the scientific debate, we tend to forget that dance performances are social events where people gather to experience art. However, the aesthetic dimension clearly deserves attention, which is why I will end this subchapter with an enactive account of aesthetics (Noë, 2015) that enriches Louppe's (2009) poetics of contemporary dance. The aim of this subchapter is to show how sense-making unfolds (as I have suggested in the prelude and in the introduction) in a performance encounter. I expect that this central concept of enactivism adds valuable

[11] The three gestures of becoming aware have been described by Varela (2000), see https://www.presencing.org/aboutus/theory-u/leadership-interview/francisco_varela.

dimensions to the processes we commonly refer to as knowing and understanding. I hypothesize that sense-making is a prevalent aspect in an epistemology of contemporary dance.

4.2.1 Enactivism – Basic Concepts

We have already come across enactive notions of knowledge in Parviainen's (2002) reflections on bodily knowledge. To fully understand the implications of those notions we have to consider the basic concepts first. As mentioned earlier, the embodiment paradigm departed from linguistic questions centred around meaning. Enactivism[12], however, took its origin in biology departing from a single cell and its organization (Maturana and Varela, 1998, pp. 43–52). By tackling the question of how to define living beings from non-living things, Maturana and Varela propose that it is the autopoietic organization that characterizes living beings (ibid., p. 47). While for the embodiment paradigm the realization that cognition is embodied occurred at a later stage of its development, for enactivism it has been an integral premise since the initial conception, as the authors declare:

> Our starting point has been the awareness that all knowing is an action by the knower, that is, all knowing depends on the structure of the knower. (ibid., p. 34)

Moreover, even if both embodiment and enactivism hold that cognition is embodied, enactivism expands the definition to conceive of cognition as not only embodied but embodied action. Both paradigms understand cognition as dependent upon sensorimotor experiences and the embedding of the cognizer within an environment; however, the additional emphasis on action refers to the assertion that perception and action are fundamentally inseparable - they have evolved together (ibid., p. 173).[13]

Moreover, the perspective on the body differs in that the lived body is seen as a single system that encompasses body (and the brain as a part of the body), mind, and environment (ibid., p. xlviii). Remember, Johnson conceptualizes the body-mind as a unity that is in close interaction with the environment but remains unable to explain the dynamics of interactive processes. The enactive view, however, posits the environment as integral for a living system.

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[12] The term enactive has been introduced by Varela in 1991 to designate the view on knowledge as one that is brought forth (Maturana and Varela, 1992, p. 255).

[13] They also refer to embodied action as enaction: 'We can now give a preliminary formulation of what we mean by *enaction.* In a nutshell, the enactive approach consists of two points: (1) perception consists in perceptually guided action and (2) cognitive structures emerge from the recurrent sensorimotor patterns that enable action to be perceptually guided.' (Varela, Thompson and Rosch, 2016, p. 173)

This becomes apparent in the re-evaluation of Neo-Darwinian evolutionary theory which holds that living organisms adapt to their environment for survival. The bottom line of this theory posits that the mechanism of natural selection ensures that organisms can sustain life only if they can cope with the current environment and optimize their fitness. This one-sided view implies that the environment is predetermined and static, and that the organism's survival is dependent on its optimized adaptivity. Enactivism rejects this idea of adaptationism and proposes a view that conceives of evolution as natural drift (Maturana and Varela, 1998, 107ff; Varela, Thompson and Rosch, 2016, p. 188) in which organism and environment are related to each other through codetermination (Thompson, 2007, p. 204; Varela, Thompson and Rosch, 2016, p. 199). They mutually specify each other as they remain in a continuous structural coupling (Maturana and Varela, 1998, p. 115). Thus, unlike in embodiment theory as put forward by Johnson, enactivism has the means to characterize the dynamics of this interaction as circular. To fully understand this statement, some basic concepts have to be explicated which I will provide by drawing on the paradigmatic case of a single cell and its metabolism.

4.2.2 Autopoiesis

As I have stated above, the main criterion for characterizing living beings is with the feature of autopoiesis (Maturana and Varela, 1980). Autopoiesis refers to an organism's self-producing and self-maintaining capacities exhibited through its organization. The term organization refers to those essential relations that must be operating for an organism to exist (Maturana and Varela, 1998, p. 42). In the case of a single cell, we have an example of a distinct unity marked by a membrane that maintains relations with its environment on an ongoing basis, otherwise it would disintegrate. Thompson (2007) explains:

> A cell is spatially formed by a semipermeable membrane, which establishes a boundary between the inside of the cell and the outside environment. The membrane serves as a barrier to free diffusion between the cell and the environment, but also permits the exchange of matter and energy across the boundary. Within this boundary, the cell comprises a metabolic network. Based in part on nutrients entering from outside, the cell sustains itself by a network of chemical transformations. But - and this is the first key point - the metabolic network is able to regenerate its own components, including the components that make up the membrane boundary. Furthermore - and this is the second key point - without the boundary containment provided by the membrane, the chemical network would be dispersed and drowned in the surrounding medium. Thus the cell embodies a circular process of self-generation: thanks to its metabolic network, it continually replaces the components that are being

destroyed, including the membrane, and thus continually re-creates the difference between itself and everything else. (ibid., p. 98-99)

Figure 3 depicts the minimal pattern of autopoiesis and clearly shows the circularity of the self-producing process. As long as the integrity of those processes and hence the homeostasis of an autopoietic system remain intact, the cell continues to self-produce. Thus, 'all its (dynamic) states are states in autopoiesis and lead to autopoiesis' (Maturana, 1999, p. 154). Maturana and Varela (1998) assert that it is by means of this mechanism that organisms are autonomous. According to Thompson (2007), autopoiesis is the paradigmatic case for autonomy.

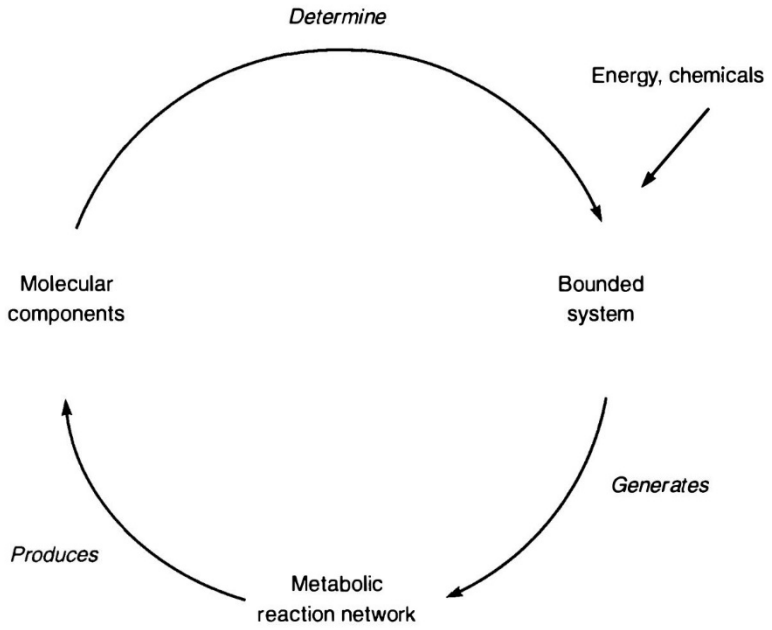

Figure 4: The basic autopoietic organization (Thompson, 2007, p. 37)

4.2.3 Autonomy

Then, what is the notion of autonomy in the enactive approach and why is it crucial? As Maturana and Varela (1998) put it, 'a system is autonomous if it can specify its own laws, what is proper to it' (ibid., p. 48). It is 'defined by its endogenous, self-organizing and self-controlling dynamics, (…) and determines the cognitive domain in which it operates' (Thompson, 2007, p. 43). In other words, an autonomous system is a structure-determining system in that its structure determines the interactions with its environment that must be in place for its autopoiesis and hence, its autonomy. It follows that an 'autonomous system is always structurally coupled to its environment' (ibid., p. 45) as demonstrated in the example of the single cell.

Structural coupling also implies that the interactions are to be understood as reciprocal perturbations (Maturana and Varela, 1998, p. 75). Perturbations merely trigger changes of structural state without a change of organization; they do not specify them (ibid., p. 97-98). As stated earlier, all dynamic states of an autonomous system are states in and lead to autopoiesis, maintaining its integrity as a unit. As these interaction processes are dynamic, they also exhibit a temporal dimension that determines the ontogeny of an organism understood as the history of structural change in a unity without loss of organization (ibid., p. 74). Notably, the structural change can either occur as a change triggered by interactions with the environment or as a result caused by the internal dynamics (ibid.).

Hence, structural coupling refers to the history of recurrent interactions between two or more systems that leads to structural congruence between them (Maturana and Varela, 1998, p. 75; Thompson, 2007, p. 45). It is also important to note that the structure of the environment only triggers structural changes. It does not specify or direct those changes because as we have stated earlier, it is the structure of the organism that specifies the domain of interactions. This of course also holds vice versa, only then can we speak of structural coupling. As Maturana and Varela (1998) assert, 'structural coupling is always mutual; both organism and environment undergo transformations' (ibid., p. 102). Thus, we can now understand the proposed concept of evolution as natural drift[14] that Thompson (2007) explains using the metaphor of partner dance:

> Like two partners in a dance who bring forth each other's movement, organism and environment enact each other through their structural coupling. Given this view of organism-environment co-determination, it follows that evolution should not be described as a process whereby organisms get better and better at adapting to the design problems posed by an independent environment. Central to evolution is not the optimization of adaptation, but rather the conservation of adaptation. […] The adaptation of a living being to its environment is therefore a necessary consequence of its autonomy and structural coupling. In other words, the condition of adaptation is an invariant of life; it is necessarily conserved as long as autopoiesis and structural coupling continue. (ibid., p. 204-205)

4.2.4 Co-emergence

Moving from the realm of the single cell on to what Maturana and Varela (1998) refer to as metacellulars,[15] we will now consider the nervous system as a closed system embedded in the

[14] Thompson (2007) describes enactive evolution as 'laying down a path in walking'. For the full discussion see Maturana and Varela (1987); Varela, Thompson and Rosch (1991); Thompson (2007).

[15] Maturana and Varela (1998) define metacellulars as follows: 'We speak of metacellulars when we refer to any unity in whose structure we can distinguish cell aggregates in close coupling.' (ibid., p. 87)

organization of multicellular beings. Of course, a nervous system consists of millions of cells. To be more precise: its structure is made up of aggregates of cells in close coupling and function as integrated components of the second-order autopoietic unity which is the organism. What a single cell and a nervous system have in common is the property of operational closure[164] (Maturana and Varela, 1998, p. 89). Drawing on Maturana and Varela (1998) and Varela (1997), Thompson (2007) explains that the 'fundamental logic of the nervous system is to couple movement and a stream of sensory activity in a continuous circular fashion' (ibid., p. 46-47). The nervous system is thus constituted by a sensory surface, a motor surface and the neuronal network that coordinates dynamically between both surfaces (Maturana and Varela, 1998, p. 153). This interneuronal network is said to expand the realm of interactions of an organism tremendously due to the varied pattern of activity within the interneuronal network (ibid., p. 159).

The nervous system is operationally closed as it constantly seeks internal balance of sensorimotor correlations. External perturbations only modulate the internal homeodynamic state of the nervous system. Maturana and Varela (1998) argue:

> […] the nervous system's organization is a network of active components in which every change of relations of activity leads to further changes of relations of activity. Some of these relationships remain invariant through continuous perturbation both due to the nervous system's own dynamics and due to the interactions of the organism it integrates. (ibid., p. 164)

Thus, any behavior that we can observe in a sensorimotor organism is just - as Maturana and Varela (1998) put it metaphorically - 'the outside view of the dance of internal relations of that organism' (ibid., p. 166). Note that the brain engages primarily in self-modifying processes (Minsky, 1988, p. 288): this ongoing, self-organizing brain activity is not determined but modulated by the sensorimotor coupling of the organism with its environment (Varela, Thompson and Rosch, 2016, pp. xxvi–xxvii).

Figure 4 depicts the organizational closure of the nervous system. In comparing figure 3.1 and figure 3.2, Thompson (2007) maintains:

[164] Thompson distinguishes between operational and organizational closure while Varela uses the terms interchangeably. I follow Varela's example.

Whereas autopoietic closure brings forth a minimal "bodily self" at the level of cellular metabolism, sensorimotor closure produces a "sensorimotor self" at the level of perception and action. (ibid., pp. 48-49)

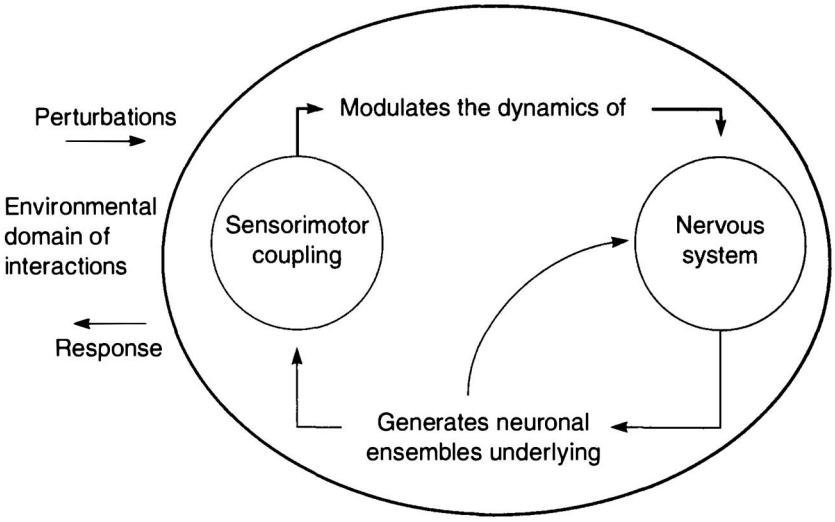

Figure 5: Organizational closure of the nervous system (Thompson, 2007, p. 39)

He goes on to explain that network closure not only brings forth selfhood but also a 'correlative world or environment of otherness' in a co-emergent manner (ibid., p. 49). Thus, for an animal 'the environment emerges as a sensorimotor world through the actualization of the organism as a sensorimotor being' (ibid., p. 59). This idea of an animal's sensorimotor world is exactly what von Uexkull has coined the *Umwelt*, referring to 'the world as it presents itself to that animal thanks to its sensorimotor repertoire' (ibid.). Figure 5 depicts the logic of this co-emergence.

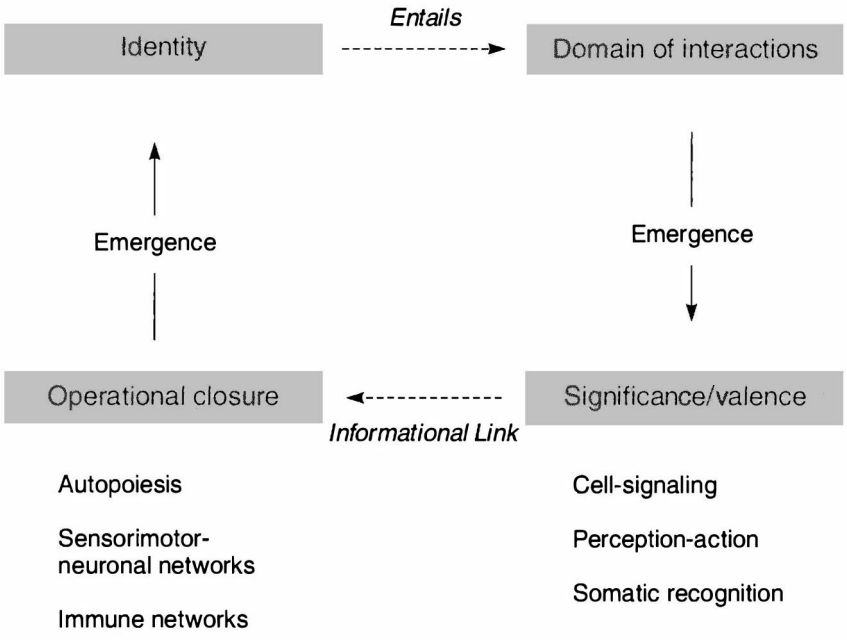

Figure 6: Co-emergence of autonomous selfhood and world (Thompson, 2007, p. 52)

4.2.5 Sense-making

To proceed with my argument that enactivism offers alternative approaches to enrich the discourse on dance and knowledge, we must cover one last central notion of enactive theory: sense-making. Recall that the environment co-emerges with the self and that the self is autonomous by having operational closure, therefore, generating an identity and determining the domain of possible interactions with the world by its own structure and ontogeny. Varela (1997) adds that it is the configuration of the emerging interactive level that creates a perspective with its own normativity. It serves as a point of reference for the domain of interactions which means that living systems bring forth significance (ibid., p. 73-74). Sense-making is thought to be the interactional and relational side of autonomy (Stapleton and Thompson, 2008, p. 25). Drawing on Varela (1997), Thompson (2007) states:

> Living is a process of sense-making, of bringing forth significance and value. In this way, the environment becomes a place of valence, of attraction and repulsion, approach or escape. (ibid., p. 158)

The prime example that illustrates this point is that of chemotaxis (Maturana and Varela, 1998; Stapleton and Thompson, 2008; Thompson, 2007; Varela, 1997). Chemotaxis refers to the movement of a motile cell in a direction corresponding to a gradient of increasing or decreasing concentration of a particular substance. Escherichia Coli (E.Coli), a motile bacteria that can sense the concentration of sugar through molecular receptors in their membrane, will move towards the greatest concentration of sugar when swimming in a sucrose gradient. As long as they do not sense sugar they tumble about. Their movement thus depends on their perception and vice versa, therefore exemplifying the sensorimotor loop they embody (Thompson, 2007, p. 157). The crucial point, however, is that sucrose possesses no intrinsic 'food significance except when a bacteria swims upgradient and its metabolism uses the molecule in a way that allows its identity to continue' (Varela, 1997, p. 79). Its status as nutrient is a relational feature linked to the bacterium's metabolism and only valid or meaningful in the milieu the organism brings forth (Thompson, 2007, p. 158). Thompson & Stapleton (2008) write:

> This example is meant to illustrate that even the simplest organisms regulate their interactions with the world in such a way that they transform the world into a place of salience, meaning, and value—into an environment (Umwelt) in the proper biological sense of the term. This transformation of the world into an environment happens through the organism's sense-making activity. (ibid., p. 25)

The authors also provide a clear-cut definition of sense-making as 'viable conduct in relation to what has salience and value for the system' (ibid., p. 26). Let me summarize the main propositions of enactive theory by drawing on Thompson (2007):

1. Life = autopoiesis and cognition.
2. Autopoiesis entails the emergence of a bodily self.
3. Emergence of a self entails emergence of a world.
4. Emergence of a self and a world = sense-making.
5. Sense-making = enaction. (ibid., p. 158)

In having covered the basic concepts of enactivism in broad strokes I intended to substantiate Parviainen's (2002) epistemological framework quoted earlier in chapter 3. I criticized that she subsequently did not integrate this conception of knowledge in her analysis. In the following I aim for accomplishing that; however, I will not focus on individual knowledge as Parviainen (2002) did. Rather, I am interested in enactive accounts of social cognition that emphasize the interaction between individuals. The basic concepts explained above are also necessary to understand the theories I will draw upon in the next subchapter.

4.2.6 Participatory Sense-making

Now that we have covered the basic notions of enactive theory, we turn to the domain of social cognition. Thompson and Varela (2001) point out that the embodiment of human subjectivity consists of three dimensions: self-regulation, sensorimotor coupling, and intersubjective interaction (ibid., p. 424, see also Thompson, 2007, p. 243) arguing for a radical embodiment stance. We will now zoom in to the third dimension, the social domain. Enactive social cognition research defines social interaction as follows:

> Social interaction is the regulated coupling between at least two autonomous agents, where the regulation is aimed at aspects of the coupling itself so that it constitutes an emergent autonomous organization in the domain of relational dynamics, without destroying in the process the autonomy of the agents involved (though the latter's scope can be augmented or reduced). (De Jaegher and Di Paolo, 2007, p. 493)

Two aspects are important here: first, the recognition of the interaction process as emergent and autonomous domain in which autonomous social agents participate through their coupling.

As such, individuals co-emerge as interactors with the interaction; and the interaction process emerges when social encounters obtain operational closure through coordination (ibid., pp. 492-493). According to the authors, it is the coordination of movements (including utterances) that affects individual sense-making. They speak of participatory sense-making when through the coordination of interactivity new domains of sense-making are available to the individuals (ibid., p. 497).

Building on that definition, Fuchs and De Jaegher (2009) propose 'a concept of social understanding as an ongoing, dynamical process of participatory sense-making and mutual incorporation' (ibid., p. 465). Understanding, they argue, 'arises in the moment-to-moment interaction of two subjects' (ibid., p. 466, emphasis omitted),[17] whereby the embodied interaction process includes bodily resonance, affect attunement, coordination of gestures, facial and vocal expression (ibid.). As such, 'social understanding is primarily based on intercorporeality' (ibid., p. 482).

I suggest that these definitions are applicable to a performance encounter. Recall that Louppe (2009) conceives of the performance encounter as an intensified and exceptional dialog between bodies in which the kinesthetic dimension is emphasized and which evokes bodily resonance. Enactive social cognition research indicates that social cognition is based on sensorimotor resonance too (Thompson, 2007, pp. 393-395). Action observation of other individuals activates the motor system of the observer involuntarily. In other words, it seems to be hardwired that we resonate with observed movements of another person. In addition to this sensorimotor coupling, there is also an affective coupling in place. Note that for enactivists, sense-making comprises emotion and cognition alike. The claim that there is no fissure between the affective and the cognitive domain is backed up by neuroscientific evidence (De Jaegher and Di Paolo, 2007, p. 488; Stapleton and Thompson, 2008, pp. 26–27).[18] The neural mechanisms for affective resonance are similar to those of sensorimotor resonance: the perception of emotion activates neural networks that generate affective states (see Thompson, 2007, p. 395). Considering these findings, I suggest that contemporary dance guides our attention to those mechanisms of resonance that indeed form the basis of our daily social interactions but which we are not consciously aware of. In a performance situation, the audience does not engage as a communication partner that actively participates in the coordination of the dynamics of this dialog (that would be the case in mutual incorporation). Rather, the audience

[17] De Jaegher and Di Paolo (2007) as well as Fuchs and De Jaegher (2009) focus on dyadic interactions as it reduces the complexity.

[18] For a full review of neuroscientific evidence for this argument see Thompson (2007, pp. 360–381).

is participating in that it is engaged with the sensorimotor and affective coupling with the bodies on stage. It engages and participates by "sensing-in".[19]

The fact that performers and audience unequally contribute to this interaction can be accounted for with the notion of unidirectional incorporation (Fuchs and De Jaegher, 2009, pp. 472–474). We can speak of unidirectional incorporation when handling a tool whereby the tool is integrated in one's motor schema but also when watching movies and resonating with the characters. Fuchs and De Jaegher (2009) describe this resonance as follows:

> For instance, when looking at characters in a film, we sense their expressions and actions *with our own body*. Our perception of others always includes a *proprioceptive component that connects their bodies to our own.* (ibid., p. 473, emphasis added)

However, there are cases when the incorporation becomes decentered. Fuchs and De Jaegher (2009) argue that this is the case when unidirectional incorporation involves fascination, for example when watching an acrobat or listening to a spellbinder (ibid., pp. 473-474). In such situations, the audience is absorbed by the performance. In contemporary dance, however, there may well be the experience of fascination, but not merely. What comes into play is the aesthetic attitude on behalf of the absorber. Being open to unexpected perturbations (that may or may not be experienced as fascinating) could also be described as epistemic openness (Parviainen, 2002, p. 16). Why would only dancers exhibit this trait? Epistemic openness can be understood as the willingness to let oneself be involved without knowing exactly what it is one is about to involve oneself with. While the degree of resonance depends on the receptivity of the absorber and can be experienced as a merging or as a conflict (Louppe, 2009, pp. 65–66), in either case, it is the degree of absorption that causes the decentered incorporation (even in the experience of a disturbing conflict). As Fuchs and De Jaegher (2009) argue:

> The object or person […] becomes the external source of the vectors or field forces that command our body. In other words, the centre of the 'operative intentionality' of our body shifts towards that of the other. (ibid., p. 474)

This is what Nancy (2006) refers to when he writes: "Sein Tanz hat an meiner Stelle begonnen. Er oder sie hat mich deplaziert, hat mich beinahe ersetzt" (ibid., p. 89). But even if

[19] Gertrude Stein refers with this term to the empathetic perception of the bodily presence of another person (Thompson, 2007, p. 389)

we sense expressions and actions of others with our own body and experience a decentered incorporation, the autonomy of the absorber nevertheless remains intact. It is merely reduced, while the autonomy of the performer is augmented (see the cited definition of social interaction above). In the case of a performance encounter the regulation of the coupling is characterized by the sociocultural convention of the performance setting which also predetermines the degree of autonomy during a performance. This asymmetrical distribution of autonomy leads to an interaction referred to as orientation (De Jaegher and Di Paolo, 2007, p. 499).

I have stated earlier that contemporary dance calls attention upon our sensorimotor and affective coupling. More accurately, it is the performer that - enabled by the regulation of the coupling - guides our attention to these processes by sharing his or her bodily presence and movements. In doing so, the performer becomes an orienter, and the absorber the orientee. According to De Jaegher and Di Paolo (2007), such cases of orientation are ubiquitous (ibid., p. 498). An example would be the game of charades whereby one player has to mime a phrase or an object that the other players have to guess. The player orients his teammates by using gestures. De Jaegher and Di Paolo (2007) describe orientation as follows:

> Calling attention to what is salient to one of the interactors and not yet the other is achieved by the purposeful modulation of the sense-making of one interactor (…) by the other (…). (ibid., p. 498)

Therefore, orientation - understood as one possible form of coordination - can make new domains of sense-making available. How does this apply in the context of contemporary dance? The purposeful modulation of the sense-making initiated by the performer roots in the dance work, as Louppe (2009) terms it; it starts with the exploration of the body that evokes 'all the other possible bodies, those poetic bodies, that by transforming their own materiality are capable of transforming the world' (Louppe 2009, p. 57, translation CR). What is salient to the performer is what she has come to know in her movement research. This knowledge consists of experiences that she embodies and shares as an orientation for and with the audience. It is an invitation to dance, as Nancy (2006) puts it; an invitation to discover the multiple possible bodies that contemporary dance practices reveal and invent. However, unlike in the game of charades where the orientation is directed towards the right answer, in contemporary dance the sense-making process remains polyvalent and ambiguous. It remains open-ended as its perception echoes in aftereffects post hoc.

That leads us once more to the persistent question: what does understanding contemporary dance mean? To recall Fuchs and De Jaegher's (2009) quote again: social understanding 'arises

in the *moment-to-moment interaction* of two subjects' (ibid., p. 466, emphasis added). Drawing on Louppe's (2009) observation that there are three reasons for the intensified dialog with its specific aesthesia (1) the dialog encompasses an encounter in time and space, 2) the encounter cannot be postponed, 3) the encounter comes with a perceptual experience of time and space, a sort of conscious experience of the experience) and recalling Merce Cunningham's definition of dance (it is not only movement in time and space, but also its opposite: non-movement in time and space), we can establish that the non-movement is where the process of redirecting one's attention and thus one's interaction qua orientation begins. In this gesture lies the pivotal factor of contemporary dance. It is not surprising then, that a recurring theme in contemporary dance pieces is stillness - both of body and of sounds - challenging the audience to stay present as they orient themselves towards the presence of the performer. This quality of presence, that dancers develop both in movement and in stillness, is what reminds dancers and audience alike of the importance of the moment 'as the only possible frame for the appearance of the unknown, like a rupture of experience' (Louppe, 2009, p. 135, translation CR). Presence is therefore a precondition for undergoing a new experience; or expressed in enactive terms: for entering new domains of sense-making. Phase 2 enaction is at play here: a different mode of knowing in which the mind is simply present and available (Varela, Thompson and Rosch, 2016, p. xl). Being present is being mindful. In the enactive approach, mindfulness practices are conceptualized 'as skilful ways of enacting certain kinds of embodied states and behaviors in the world' (Varela, Thompson and Rosch, 2016, p. xxiv). The workings of meditation practices can be described as follows:

> (…) meditation instructions make use of the marvelous human capacity to move one's attention in order to direct that attention in ways that will reveal aspects of experience hitherto unnoticed or unacknowledged. (Varela, Thompson and Rosch, 2016, p. xliii)

These unnoticed and unacknowledged experiences are unfamiliar and thus unknown. They form the new domains of sense-making that become available by participating in a performance encounter. However, these domains of sense-making are not solely to be understood in terms of renegotiating meaning. A performance - like a meditation - offers 'openness and space in which a transformation of what the subject itself is, or could be, becomes possible.' (Varela, Thompson and Rosch, 2016, p. 126). As Louppe (2009) points out, the undetermined body in contemporary dance is the site where the search for the subject takes place (ibid., p. 70). Remember that contemporary dance practices involve 'the search for the becoming of the body'

(ibid., p. 66) revealing and actualizing the plurality of bodies, the unfamiliar, unknown bodies. In the same way the body is embedded in a logic of becoming, so is the process of subjectivity. Louppe (2009) asserts that all genres of art speak of the agency and the consciousness of a subject in the world. In contemporary dance the primary material or medium is the body, which is what marks and situates the dancer as a subject in the world. With this 'substance of the self' the dancer builds a universe of significance (Louppe, 2009, pp. 36–37).

However, this universe is a fleeting one. Dance is ephemeral; movement ceases readily the moment it has begun so that it is hard to bring it into the universe of language as Meg Stuart and Tim Etchells so pointedly capture. The domain of language in their piece *Shown & Told* stands for the universe of fixed meanings in which our mind engages in phase 1 enaction. Varela, Thompson and Rosch (2016) explain:

> The untamed mind constantly tries to grasp some stable point in its unending movement and to cling to thoughts, feelings, and concepts as if they were a solid ground. (ibid., p. 26)

Contemporary dance challenges this habitual grasping not only by its inherent quality of ephemerality. It is also through the artistic procedures of defamiliarization and displacement that cause aggravation of perception. In enactive terms, we could speak of a suspension or interruption in the habitual sense-making process of an individual in the audience. Taken together, what are the implications for our guiding question: what does understanding contemporary dance mean?

Drawing on enactive social cognition research, meaning emerges due to the dynamical coupling of two or more agents (Fuchs and De Jaegher, 2009, p. 479). It is generated and created 'in the interplay between interacting individuals and the interaction process itself' (ibid., p. 466). However, as we have already established earlier, in a performance situation the audience is oriented towards new domains of sense-making without confirming emergent meanings intersubjectively due to the asymmetry of the interaction. As absorbers we are oriented towards an experience, but sense-making is our job so to speak. Understanding is an achievement, as Noë (2015) claims.

Meg Stuart conceives bodily states as having potential narrative (Stuart, 2012, p. 137) and consequently potential meaning with new domains of sense-making become available. I have stated earlier that the artistic emphasis lies in offering a space of potentiality and fragmentariness as opposed to intentionally building a narrative. Clavadetscher and Rosiny (2007) recognize that the principle of fragmentariness found in contemporary dance requires an

aesthetic attitude of openness on behalf of the recipient (ibid., p. 15). I can now add that it is the polyvalence of the undefined that aggravates sense-making, and by doing so enhances our awareness of our own sense-making processes - whether by experiencing subtle frustration, severe disturbance, sheer puzzlement, or pure fascination.

4.2.7 Enactive Aesthetics

We are still left with the problem of knowledge and understanding. I would like to recall an earlier quote from Brandstetter (2007) that outlines the particulars of the problem:

> Dance has a special power of evoking moments of enchantment, enthusiasm or shock that render ›speechless‹ in certain respects; on the other hand, this experience of speechlessness often supports the prejudice that it cannot involve knowledge. However, the knowledge in question is a different kind of knowledge: sensual, erotic and unstable – and it goes without saying, also cognitive; knowledge that touches on the boundaries of knowledge and zones of non-knowledge (also and in particular of ›not-knowing-oneself‹). One of these boundaries is indicated by the absence of language for this knowledge gained through experience. (ibid., p. 43)

Let us look at enactive accounts on knowledge. A prominent enactive definition of knowledge is effective action or behavior in a given context (Maturana and Varela, 1998, p. 29, p. 174). It refers to the 'concrete, embodied and lived skills for active coping with a constantly changing environment' (Vörös and Bitbol, 2017, pp. 39–40). It is this kind of knowledge that allows us to embark on a life as a member of human society. Varela, Thompson and Rosch (2016) summarize:

> The central insight of this nonobjectivist orientation is the view that knowledge is the result of an ongoing interpretation that emerges from our capacities of understanding. These capacities are rooted in the structures of our biological embodiment but are lived and experienced within a domain of consensual action and cultural history. (ibid., pp. 149-150)

However, 'art imparts no knowledge', as Noë (2015, p. 193) boldly argues. He even claims that the right (first) response is perplexity - having no clue, feeling lost (ibid., pp. 109-110) because he conceives of art works as strange tools made for investigating ourselves (ibid., p. 30). Art puts us on display and unveils us to ourselves (ibid., p. 101), he asserts. It 'is disruptive and destabilizing, it is a mode of investigation, a form of research aiming at transformation and reorganization' (ibid., p. 73). His main claim is that art is a reorganizational practice (ibid., p.

16). This proposal rests on the enactive view: the social domain is constituted by third-order couplings entailing a co-ontogeny of its participants (Maturana and Varela, 1998, p. 193). Without going into the details of this perspective, I want to emphasize that it is the idea of organization that is important here. The enactive theme is the deep continuity of mind and life, and as such the organizational feature runs like a red thread throughout all dimensions of life. Thus, in line with that core aspect, Noë (2015) states that our lives are structured by organization (ibid., p. 29). He proposes two levels of cultural life: level 1 activities encompass our daily actions and behaviors whereas level 2 practices, like art and philosophy, bring into view how we are habitually organized on level 1. These two are interconnected as art draws from level 1, reshapes and loops back to level 1 activities. The change that art brings forth is a reorganization of our ways of perceiving, and thus, of ourselves (ibid., p. 138). In arguing that choreography and philosophy share a common concern, he states that both are practices and methods of research 'aiming at illuminating the ways we find ourselves organized and so, also, the ways we might reorganize ourselves' (ibid., p. 17).

I certainly agree with the main claims of Noë's enactive aesthetic theory as it is in line with what I have established so far. However, I would like to elaborate his argument of how dance is a reorganizational practice and adjust it specifically to contemporary dance maintaining his principal claim that art is a reorganizational practice. Noë (2015) asserts that 'choreography puts the fact that we are organized by dancing on display' (ibid., p. 13). Hence, he looks at dance as choreography (level 2 practice) against the background of social dancing (level 1 activity). However, I would like to zoom in onto another level that specifies contemporary dance in claiming that contemporary dance primarily puts the moving body on display. It puts on display how our bodies are organized by displaying reorganized bodies. To refine this statement, we can draw on Louppe's (2009) notion of the body as ever-changing corporeality. Remember that she conceives of the body as a network of interrelations and a field of interferences that owns the ability to organize those interferences (ibid., p. 68). Hence, the body at display is not the physical body; it is the body as a network of interrelations enacting time, space, gravity, and subjectivity; it is the self-organizing field of interferences that perturbs and is being perturbed in an ongoing exchange with its environment. With this notion of the body, we come full circle as it resembles the enactive conceptualization of the body as an autonomous system that maintains relations on different levels (self-regulation, sensorimotor coupling, and intersubjective interaction) to bring forth its identity and its environment. However, in the case of contemporary dance, this bringing forth of identity can be disturbed as our habitual perception, or put in enactive terms, our sensorimotor coupling, is being challenged. It is in this

way, that contemporary dance is disruptive and destabilizing and eventually transformative. Contemporary dance offers 'intimate perceptions' (Louppe, 2009, p. 23) that resonate deeply within us stirring up our sense of identity. In that sense art can indeed be experienced as an unwanted gift as Meg Stuart has stated in her piece *Hunter*[20].

It is in this way that reorganization also aims at understanding (Noë, 2015, p. 138). For Noë (2015), understanding is an achievement against the background of our knowledge, skills, situation and social environment (ibid., pp. xi-xii, 111). The aesthetic pleasure arises 'from being lost to being found' (ibid., p. 78) as 'we grapple with what we already know (or think we know)' (ibid., p. 203). Understanding is transformation that occurs when we move from 'not seeing to seeing, or from seeing to seeing more or seeing differently' (ibid., p. xii). This certainly pertains to fine art; for contemporary dance I would substitute the word "seeing" with "sensing". Either way, both terms must be understood as multisensory perceiving. Thus, understanding is transformative, resting upon the integration of perturbations in the constant processes of sense-making. It is the *oscillating* movement from not sensing to sensing, or from sensing to sensing more or sensing differently that makes up the dynamics of aesthetic experience in an open-ended manner, sometimes reverberating until long after the actual performance encounter. I propose to refer to this oscillating movement as recognizing, de-cognizing and cognizing. Thus, in a way Brandstetter (2009) is right, although dance does not solely involve unstable knowledge but effects it too. We might enter the zone of 'not-knowing-oneself', a zone without grounds. Contemporary dance aims at evoking this sensation of not knowing - it challenges our current understanding and seeks to engage us anew in the process of sense-making.

4.3 Neuroaesthetics of Dance

Now that I have pondered on possible theoretical grounds for an epistemology of contemporary dance drawing on embodiment theory and enactivism, it is time to consider empirical research. How does neuroaesthetic dance research fit into the proposed framework? Is it possible at all to synthesize empirical findings with an enactive account of aesthetics based on completely different ideals? How can data generated from a reductionist approach to the brain be productive in this paradigm? In more precise terms, I want to raise the question of how the neuroaesthetics of dance (which is not focused on contemporary dance alone) could inform an epistemology of contemporary dance. After all, we have seen that embodiment and

[20] I attended the performance on 21st of April 2017 in TQW.

enactivism draw on neuroscientific findings too - although not exclusively, but rather in combination with philosophical lines of thought, such as pragmatics and phenomenology.

It may have been a coincidence that neuroaesthetic research of dance started at the peak of the discussion of dance and knowledge which subsequently has ceased, while the neuroaesthetic investigations took off. As far as I can tell, these endeavors went largely unnoticed by dance scholarship despite prominent collaborations between dancers and neuroscientists[21]. I can only speculate why this has been the case. It is indeed difficult to interpret a neuroscientific article from a dance scholar point of view, since neuroscientists ask fundamentally different questions. Moreover, neuroscientific research must meet criteria with regards to the deployed experimental design, so as to generate scientifically valid data. Adhering to those set standards in turn, allows for a limited scope of research questions which for dance scholars might not be of interest, simply because their disciplinary scope is focused on different issues. From a dance scholar's perspective, neuroscientific research can be easily dismissed for being reductionistic (Hagendoorn, 2012).

In the following, I will give a short overview of the young field of neuroaesthetics and the criticism it has received from scholars. Although Noë (2015) and other scholars of enactive stance dismiss neuroaesthetics wholly (Fingerhut, 2018, p. 80), I do want to point to productive ways of how empirical research could support more philosophical accounts of contemporary dance. Turning to the neuroaesthetics of dance then will expose the challenges of the field which the researchers are partly well aware of and critical themselves. Finally, I want to highlight a neurophenomenological approach that points in a fruitful direction. The aim of this subchapter lies not in the detailed discussion of the findings of neuroaesthetic research, but in reflecting the premises and concepts that are in conflict or in accordance with an envisioned epistemology of contemporary dance.

4.3.1 Reviewing Neuroaesthetics

The term neuroaesthetics has been coined by Semir Zeki (Di Dio and Gallese, 2009) who introduced the empirical study of experiencing visual art. As such, the focus of subsequent work in this area has been concerned with visual perception using portraits, paintings, and sculptures as stimuli. The goal of neuroscientists was to understand the neural underpinnings of the aesthetic experience which has been conflated with appreciation of beauty, aesthetic appraisal, and/or aesthetic judgment (ibid.).

[21] see http://motionbank.org/en/event/dance-engaging-science-workshop-no-1.html

Unlike those earlier approaches who understood neuroaesthetics as an endeavor for defining universal rules for relating objective properties of artworks to brain regions specialized for perceiving beauty (Pearce *et al.*, 2016, p. 267), more recent research undermines and questions this approach. For example, in their review of the field Di Dio and Gallese (2009) state that findings so far are heterogeneous which in their view results from 'the lack of a fixed consensus on the definition of "aesthetic experience"' (ibid., p. 682). For visual artworks, the findings suggest the activation of sensorimotor areas, core emotional centers and reward-related centers which in turn leads to a redefinition of the aesthetic experience as a multimodal experience referred to by the authors as 'perceive-feel-sense' (ibid.).

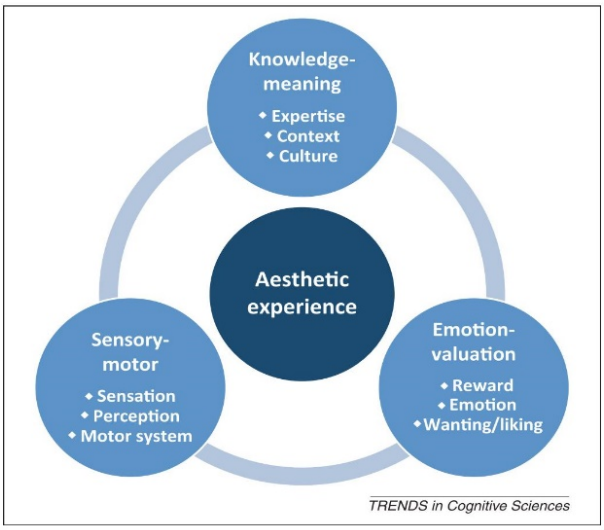

Figure 7: The aesthetic triad (Chatterjee and Vartanian, 2014, p. 371)

Another recent and constructive model - the aesthetic triad - has been proposed by Chatterjee and Vartanian (2014) in which they define aesthetic experiences as 'emergent states, arising from interactions between sensory-motor, emotion-valuation, and meaning-knowledge neural systems' (ibid., p. 371). They admit that of these three systems, the contribution of the meaning-knowledge system to the aesthetics experience is least well studied because 'it varies substantially across individuals, cultures, and historic epochs' (ibid.). This is certainly where the humanities' contribution is needed. In an attempt to consolidate the emerging field of neuroaesthetic research and to clarify the aims and scope, Pearce and colleagues state:

(…) a cognitive neuroscience of aesthetics would investigate the complex cognitive processes and functional networks of brain regions involved in those experiences *without placing a value on them*. Thus, the cognitive neuroscientific approach may develop in a way that is mutually complementary to approaches in the humanities. (265, emphasis added)

They argue that neuroaesthetics must draw on philosophical aesthetics and art theory to complement each other in a fruitful way and refer to current research projects that are essentially interdisciplinary (see Pearce *et al.*, 2016, p. 271). More poignantly, they assert that to understand aesthetic experiences in terms of brain functions does not imply the disregard of the importance of subjective experience. Rather, neuroscientific findings should act in complement to phenomenology and other approaches that are concerned with the study of the mind (ibid., p. 269).

A critique point coming from the humanities is that neuroscientists place art works and subjects out of context. In fact, in neuroscientific research a participant finds herself in an experimental setting that simulates the art experience. For example, when using fMRI as a method, the subject has to lie in a scanner while artworks are shown to the subject as images projected onto a screen. Such a situation is indeed far from an experience in an actual museum. This is a valid argument against the feasibility of neuroaesthetic undertakings, and it has been taken seriously. More research is carried out in live settings, such as music concerts and dance performances, and in museums (see Pearce *et al.*, 2016, p. 270). Researchers are thus aware of the fact that lab-based studies with artificial stimuli lack ecological validity and require a complementary approach (ibid., p. 275). By now the role of the semantic context is also being acknowledged as studies have focused on the influence of the subject's prior knowledge of the presented artworks (see Chatterjee and Vartanian, 2014, p. 371; Pearce *et al.*, 2016, p. 274).

Finally, Pearce and colleagues clarify the scope of the field by delineating the cognitive neuroscience of aesthetics from the cognitive neuroscience of art which overlap when neuroaesthetics focus on art. As such, the neuroscience of aesthetics encompasses a broad range of other objects like design, faces, natural visual scenes, and even scents and tastes (see Pearce *et al.*, 2016, p. 267). The cognitive neuroscience of art, on the other hand, is concerned with other levels of engagement with art, such as 'reflecting about self-referential aspects of art; understanding personal or social meaning of an artwork; recognizing the relation among medium, style, and content; grasping the significance in art-historical or art-critical contexts' (ibid., p. 268). This area resembles aspects that Chatterjee and Vartanian (2014) in their aesthetic triad have subsumed under the knowledge-meaning neural network. Similarly, Pearce *et al.* (2016) acknowledge that this field still awaits to be developed (ibid., p. 268). In their conceptualization of the field, they also define a subfield: the cognitive neuroscience of beauty which in principle belongs to the field of neuroaesthetics but can have an overlap with the cognitive neuroscience of art (see fig. 7). In that way, the aspect of beauty has a justified place

in the field but - and the authors strongly emphasize that - is not the central focus of neuroaesthetic investigations (ibid.).

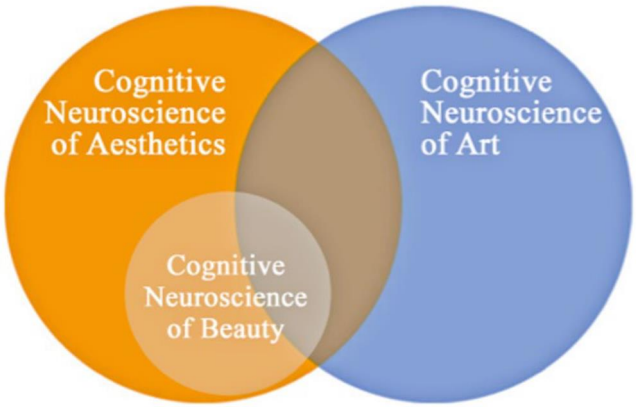

Figure 8: Scope of the field (Pearce et al., 2016, p. 267)

In doing so, they correct the course of the former reductionist approach to a wider conception of the field that is interdisciplinary and complementary to the humanities. Furthermore, they consider the socially embedded nature of aesthetic experiences as well as its wide-ranging spectrum. Finally, aesthetic experiences are thought to emerge from the interactivity of large-scale neural networks (see fig. 6), and the interaction between the (situated) individual, the (semantic) context and the (art) object. As such, they define the goal of neuroaesthetic research as understanding 'the psychological and neural processes of an individual having an aesthetic sensory experience in a given context' (ibid., p. 275) without placing intrinsic value neither on the object nor on the experience. With this set of premises in mind, the gap between the two cultures that C.P. Snow had thematized in his famous speech might be bridged with successful interdisciplinary communication. Moreover, as these premises leave behind the notion of aesthetic judgment, it complies with the value that Louppe (2009) assigns to the art of contemporary dance:

> Denn der Gedanke der Bewertung (der so wichtig in unserer ›Expertenkultur‹ ist) ist den Dynamiken des zeitgenössischen Tanzes fremd. Bedeutet dies, dass keine qualitative Annäherung an diesen Bereich denkbar ist? Gewiss nicht: Der Wert eines Werks, einer Sprache, einer Bewegung lässt sich in Bezug darauf einschätzen, inwieweit sie Fragen stellen, bereichern und erschüttern. (ibid., pp. 26-27)

While such a definition would have been irreconcilable with the quest of understanding the neural correlates connected to perceiving beauty, the current premises defined by Pearce *et al.* (2016) open up a possible pathway to also account for aesthetic experience in the context of contemporary dance. A model that includes such a wide range of aesthetic responses to art has been proposed by Pelowski *et al.* (2017). With the so-called VIMAP (Vienna Integrated Model of top-down and bottom-up processes in Art Perception), the authors provide a sophisticated model of art perception that accounts for the highly complex phenomenon of engaging with art. In explaining their encompassing approach, they explain:

> Specifically, we focus on the need to integrate bottom-up, artwork-derived processes, which have formed the bulk of previous theoretical and empirical assessments, with top-down mechanisms which can describe *how individuals adapt or change within their processing experience*, and thus how individuals may come to particularly *moving, disturbing, transformative, as well as mundane, results*. (ibid., p. 80, emphasis added)

As we can see from this statement, a wide range of responses is being included while the aesthetic experience is seen as a change or adaptation in the individual. Such an account seems to pertain to contemporary dance as they even address provocative reactions, such as chills, awe, thrills, and the sublime (ibid.). However, given the scope and the focus of this thesis, I cannot discuss here whether this model would be suitable for being a valuable partner in supporting an aesthetics of contemporary dance.

To return to my line of argumentation, recent works that demonstrate the kind of orientation laid out by Pearce *et al.* (2016) can be found in the collection edited by Scarinzi (2015). In this volume, the contributions are not solely focused on the perception of art but treat aesthetics as a pervasive phenomenon of human life which also is in line with Johnson's proposal of an aesthetics of understanding (see chapter 4.1). It includes views from embodiment and enactive scholars as well as from neuroscientists working in the field of neuroaesthetics of dance. At this point, I would like to quote Emily Cross, one of the pioneers in this field, who reflects on the aims of her research:

> More recently, exciting new interdisciplinary research ventures and funding opportunities are emerging that are opening new doors for more collaborative research between dancers and scientists from a number of different disciplines, (…). Such interdisciplinary work holds great promise for advancing our understanding of the (neuro)science of art production, performance and evaluation, and

ultimately what it means to be a member of a species that sees, feels, creates and is moved by movement. (Cross 2018, 233, emphasis added)

Thus, the common denominator of embodiment, enactivism, dance neuroscience and contemporary dance is their interest in the agency and the consciousness of the socially and culturally situated human being in the world and its lived experience. It is necessary to keep that in mind before we turn to the question of how the neuroaesthetics of dance can contribute to an epistemology of contemporary dance.

4.3.2 Investigating Dance

The very first paper that explicitly dealt with the aesthetic dimensions of dance was published by Calvo-Merino *et al.* (2008). I would like to discuss this fMRI study in greater detail for highlighting the challenges and problems that arise in neuroaesthetic investigations of dance.

Let me first sketch the experimental design. The subjects were 6 males without previous experience as observers nor as performers with the dance styles used in the study. The set of stimuli consisted of 24 dance videos each with a duration of 3 seconds, showing 12 movements from classical ballet and 12 moves stemming from capoeira that would resemble each other in terms of speed, movement direction, body part involved, and body location in space. They were performed by a professional ballet dancer and an expert capoeira dancer, respectively. The faces of the dancers were blurred to avoid face processing, and the dancers matched each other in appearance, body size and clothes. The background was neutral.

In the first testing session, the videos were shown to the subjects in randomized order with each video being repeated 4 times. The subjects were given a dummy-task to make sure they pay attention to the videos. They had to rate whether they thought a movement was particularly tiring on a keypad during the scan. No instructions concerning their aesthetic evaluation were given.

In a second testing session, the subjects were explicitly asked to rate their aesthetic experience using a questionnaire. It was built around 5 dimensions: simple-complex, dull-interesting, tense-relaxed, weak-powerful, and like-dislike. This session took place one year after the scanning sessions to ensure that the ratings are based on the neural action-observation-network, and to minimize interferences with activation from memory-related neural systems. Each video was shown once per dimension in randomized order on a computer screen. Only after the video the dimension in question was revealed and the subject had 4 seconds to indicate

his rating. These individual ratings were normalized within each subject and each dimension to remove individual differences. Then these normalized scores were averaged across subjects to create a consensus rating for each stimulus on each dimension which allowed for dividing the stimuli into 12 movements with the highest scores and 12 movements with the lowest scores.

The innovative aspects of their study consist of the use of dynamic stimuli as opposed to static stimuli, their interest in the automatic aesthetic response as opposed to explicit aesthetic judgments and studying group-average responses as opposed to individual responses (Calvo-Merino *et al.*, 2008, p. 913). Their main finding is that bilateral occipital cortices and the right premotor cortex are involved in the implicit, automatic aesthetic response to dance, thus, the visual and sensorimotor cortices (ibid., p. 917).

We readily see the first problem for dance scholars to whom the procedures that are necessary to generate a simplified dance stimulus might seem obscure and even absurd. After all, this reduction of dance to its motor elements (ibid., p. 913) plays into the critique of approaching art as an object which all too easily can lead to a general disregard of such studies. Calvo-Merino and colleagues are well aware that their approach falls far short of a dance performance situation (ibid.) that includes sounds, costumes, and lightning, but these procedures are necessary to confidently relate the activity of brain areas to specific stimulus parameters that lead to aesthetic responses (ibid.). From a neuroscientific perspective, the researchers must comply with these standard procedures to prevent large degrees of noise that could bias the generated data.

However, there are other problematic aspects that humanist scholars might demur. For example, the definition of dance as 'a dynamic visual form of artistic expression' or of the performance as an event, in which an observer watches the movements of a dancer (ibid., p. 911) mirror the ocularcentrism that pervades Western culture and neuroscientific aesthetic investigations likewise as Di Dio and Gallese (2009) have confirmed. Pointing to the heterogeneous evidence provided so far, they conclude that an aesthetic experience merely starts out as a visual experience but includes sensorimotor and affective responses as well (ibid., p. 686). My point is that these definitions were in line with the general orientation of the field which were redefined later. Nevertheless, such descriptions of dance are not useful for the aesthetics of contemporary dance. They might be at most compatible with specific techniques such as classical ballet which is based on a strictly codified system of movements that emphasizes geometrical lines and forms in space.

Even more problematic are the conclusions that the authors draw. For example, when discussing the outcome that high energetic jumps are preferred over simpler movements where no travel in space is being carried out, Calvo-Merino *et al.* (2008) suggest the following:

> Specific movement parameters such as vertical and horizontal displacement of the body may selectively target aesthetically-relevant brain areas, and thus generate specific aesthetic responses, at least in our putative average observer. Choreographers could use this information to 'neurotarget' their choreography. (ibid., p. 918)

In a similar way they conclude in the final discussion:

> Knowledge of how aesthetically pleasing actions are coded in the human brain could be applied in dance teaching and choreography. (…) Therefore, our results give rise to the possibility of a 'menu' of dance moves, from which artists could choose those which target aesthetically sensitive areas. (ibid., p. 920)

Even though the neologism of 'neurotargeting' sounds compelling, it is wholly misplaced for two reasons. Firstly, choreographers work in the domain of the lived experience, and their source of creativity is their own bodily perception in relation to the cultural framework they find themselves immersed in. It is hard to imagine that a choreographer's intention for creating a dance piece would be to stimulate visual and sensorimotor cortices in members of the audience. Secondly, the proposal of a dance movement menu that lays out which actions are 'aesthetically pleasing' simply violates the creativity in artistic processes as well as the conduct of contemporary art practices. In the words of Pearce and colleagues, Calvo-Merino *et al.* (2008) place a value on their findings, and they do so in the wrong domain I would add. Chatterjee and Vartanian (2014) have criticized such 'reverse inferences' that base psychological mechanisms solely on the location of brain activity (ibid., p. 374). Although the quoted conclusions are tentatively expressed using the subjunctive, it remains illogical why results derived from a simulated aesthetic situation could be easily transferred to the lived domain of practitioners. That indicates that there is a confusion of explanatory levels. Let us draw on the enactive view to frame this problem. In explaining why the internalism/externalism debate is superfluous in enactivism, Stapleton and Thompson (2008) state:

> The enactive approach does not accept these assumptions. What goes on strictly inside the head never as such counts as a cognitive process. It counts only as a participant in a cognitive process that exists

as a relation between the system and its environment. Cognition is not an event happening inside the system; it is the relational process of sense-making that takes place between the system and its environment. In Maturana and Varela's language (1980, 1987), cognition belongs to the 'relational domain' in which the system as a unity relates to the wider context of its milieu, not to the 'operational domain' of the system's internal states (e.g., its brain states). Of course, what goes on inside the system is crucial for enabling the system's cognitive or sense-making relation to its environment, but to call internal processes as such cognitive is to confuse levels of discourse or to make a category mistake (neurons do not think and feel; people and animals do). (ibid., p. 26)

Hence, neuroscientific findings "make sense" in comparison to other neuroscientific studies which the authors confidently and prudently demonstrate in the discussion (ibid., pp. 917-920).[22] Also, reviews that offer a synopsis of a range of studies seem to reveal the overall development of the field as results are being reflected on in a comparative manner (Chatterjee and Vartanian, 2014; Di Dio and Gallese, 2009). However, each single study contributes to the growing body of knowledge, and this initial study on dance was just the first steppingstone from which the neuroaesthetics of dance can evolve.

4.3.3 Reviewing Neuroaesthetics of Dance

Turning again to reviews, this time of the neuroaesthetics of dance, Cross and Ticini (2012) take a more differentiated approach to the aim of this nascent field:

(…) the aim of neuroaesthetic inquiry should not be the definition of rules or criteria for what makes a work of art successful or beautiful but could instead be to provide artists with an understanding of how their works alters or impacts the neurophysiology of the beholder. (ibid., p. 12)

They identify one additional line of inquiry mentioned. Studying the dancer's brain sheds light on how action experience and action observation are related (Cross and Ticini, 2012, p. 6). What is of particular interest in the context of my thesis, is 'how an individual's past motor experience sculpts this perception' (ibid., p. 7). Let us recall what Louppe (2009) states in her poetics of contemporary dance: it is the totality of perceived, internalized, and experienced movements or choreographies that determine the locus of perception (ibid., p. 23). The spur of dance movements imprints in the body of the mover as well as of the absorber (ibid., p. 18)

[22] It should be mentioned though that even in this part the authors frame their suggestions tentatively.

while the degree of resonance depends on the receptivity of the beholder (ibid., p. 65). Cross and Ticini (2012) mention two studies that support these statements:

Calvo-Merino *et al.* (2005) studied how prior dance experience impacts the perception of different dance styles. They found higher activation within parietal and premotor components of the action observation network (AON) when professional dancers were viewing movements from their practiced dance style as compared to other movement styles in which they are not trained in. They conclude that the motor repertoire that has been the result of daily training sculpts the perception.

The second study investigated the impact on neural response profiles of newly acquired action expertise in modern dancers (Cross, Hamilton and Grafton, 2006). They accompanied the rehearsal process of a dance company learning a 25-minute choreography over six weeks. Each week they scanned the brain of the dancers while they viewed segments of the choreography. During the process to master the piece, the researchers found increased activity in the inferior parietal lobule and the ventral premotor cortex, both components of the AON. Hence, the activity was found to be higher as the familiarity with the choreography increased.

4.3.4 Pioneering Approaches

Let us now turn to the topic of dance aesthetics again. I want to discuss a model that has been proposed by Orgs, Caspersen and Haggard (2016) as it connects to Louppe's (2009) definition of the performance encounter as an intensified dialog of bodies. Their main move consists of defining dance as a social art form and the performance encounter as an act of communication. The difference between their move and mine in chapter 4.2 is that they draw on social cognition research of neuroscientific provenience and communication theory derived by cognitive informatics. Their communication model is modular and consists of three components: 'the message transmitter (dancer and choreographer), the message (observed movement) and the receiver (the audience)' (Orgs, Caspersen and Haggard, 2016, p. 630). Although the authors acknowledge that the "message" often can be ambiguous and that it is an essential aspect in the work of contemporary choreographers like Deborah Hay or Pina Bausch (ibid., pp. 632, 640, 646), they nevertheless speak of recovering the intention of the message (ibid., p. 633) in an implicit language analogy. However, they do conceive of the communication in a performance as bidirectional and interactive (ibid., pp. 627, 637) as in enactive social cognition accounts and further define it as follows:

> Appreciation of dance in this context is neither just a function of dance movement features (as an objectivist aesthetics suggests) nor of the spectator's processing fluency (as a subjectivist aesthetics suggests). Instead, our emphasis on communication implies some level of *experience-sharing between dancer and spectator*. (ibid., p. 627)

They thus escape the tension between objectivist and subjectivist accounts by acknowledging the dancer-observer dyad (ibid., p. 629) but they do not consequently go along that path as they remain within the compartmentalization of the communication framework chosen: the message transmitter, the message, and the receiver. Maturana and Varela (1998) refer to this kind of framework as the tube metaphor for communication:

> According to this metaphor of the tube, communication is something generated at a certain point. It is carried by a conduit (or tube) and is delivered to the receiver at the other end. Hence, there is *something* that is communicated, and what is communicated is an integral part of that which travels the tube. Thus, we usually speak of the "information" contained in a picture, an object, or, more evidently, the printed word. (ibid., p. 196, original emphasis)

This model of communication is not compatible with enactivism for two reasons as they lay out: unities are determined structurally and can only be perturbed whereas the other model implies that interactions are instructive as if solely the intentions of the perturbing agent would determine how the information would affect the receiver. They conclude that, in fact, in a communicative interaction there is always ambiguity (Maturana and Varela, 1998, p. 196).

Although this simplified communication model is problematic, the authors do succeed in reserving a place for ambiguity. Also, the structural determination of the receiver is accounted for as the spectator's own visual and motor expertise forms the background for the epistemic actions the spectator might take in an active search for meaning (Orgs, Caspersen and Haggard, 2016, p. 640). Moreover, they acknowledge sensorimotor coupling as the core of performative dance (ibid., p. 634). Thus, in principle these moves make this neurocognitive theory of dance aesthetics a possible basic building block from which an enactive aesthetics of contemporary dance could be further developed.

Another trend that productively deals with the objectivist-subjectivist tension and is in line with enactivism[23] is to combine neuroscience with phenomenologically informed audience

[23] Neurophenomenology evolved from enactivism and the study of consciousness. Its merit is to combine first person data with third person data. However, Jola, Ehrenberg and Reynolds (2012) do not derive their understanding from that line of research.

research. This approach was chosen in the project *Watching Dance: Kinesthetic Empathy*[24]. In their reflection on the methodology applied, Jola, Ehrenberg and Reynolds (2012) argue for the importance of interdisciplinary collaboration in their field even if it comes with serious challenges in linking neuroscientific findings with complex qualitative data. I will not discuss their findings as such, rather, what is of importance for my thesis, is the fact that they bring up audience research as a way to inform their studies with the lived experience of audience members. According to the authors, qualitative audience research in the field of contemporary dance is scarce, and their approach - which is informed by hermeneutical phenomenology - is pioneering. In that framework, experience is treated as socially mediated, rather than merely personal and private (ibid., p. 28), and audience members are approached as 'active agents in constituting the meaning of the performance through articulating their experiences' (ibid.).

Drawing on Glass and Stevens (2005) who conducted interviews with contemporary dance audiences, they note that previous dance experience and pre-performance information had very little impact on the response of audience members. Rather, Glass and Stevens found that audiences were enthusiastic over post-performance discussions and enjoyed making explicit their interpretations of the piece (Jola, Ehrenberg and Reynolds, 2012, p. 28). Put in enactive parlance, they engaged in sense-making and this is exactly the point I want to make. There really is nothing in particular to understand in contemporary dance. To speak with Nancy (2006), the meaning of dance lies in the gesture of an invitation to dance here and now; an invitation to engage in the process of sense-making.

5 A few Notes on an Epistemology of Contemporary Dance

From what I have stated so far, it should have become clear that an epistemology of contemporary dance needs to integrate perspectives from dance scholars, philosophers, dancers, audience members, and cognitive scientists of various stances and disciplines. Although I have aimed for integrating all those perspectives, this proposal is far from being complete. But I hope that I could at least demonstrate of how the different perspectives could support each other.

In this interdisciplinary endeavor, it is of utmost importance to not lose sight of what kind of knowledge we take interest in. I believe that when it comes to art we are primarily interested in experience. Knowledge as experience or experiential knowledge? These terms still imply that knowledge, abstract knowledge, is the leading category. Considering Johnson's (2007)

[24] See www.watchingdance.org

proposal of an ‘aesthetics of human understanding’ might foreground experience as the primary mode of knowing.

This also highlights the reasons for inquiring contemporary dance: it means investigating the specific ways of knowing that dance entails and the extraordinary processes of understanding it requires and facilitates, as Gehm, Husemann and Wilcke (2007a) have put it. However, I contend that they are only specific and extraordinary as they do not comply with the common standard account of knowledge we share as a knowledge society. Shedding light on dance and its practices of knowing could reveal the potential of conscious, lived experience that Varela, Thompson and Rosch (2016) have referred to as phase 2 enaction in which transformation can occur.

Let me close with one final thought: I have started out with the question of what understanding contemporary dance means. At the end of my considerations, it seems that the answer is the inversion of the question. Contemporary dance makes us understand as it affords us to engage in our sense-making processes.

6 Conclusion

The guiding question for this thesis was if cognitive science could contribute to laying grounds for an epistemology of contemporary dance. As such the analytical goal was to investigate the status quo of the field, the problems and issues dance scholarship faces with defining dance knowledge, and the capability of theories and research from cognitive science to account for a theory of knowledge that could account for dance knowledge. On the one hand, this meant integrating and synthesizing dance scholarship with approaches stemming from cognitive science; on the other hand, it meant clarifying the contributions cognitive science could make.

I started out by providing a definition of contemporary dance that at its core uses procedures that somatic methods had introduced to contemporary dance practice. The key gesture lies in redirecting attention to one’s own bodily awareness in movement research. By drawing on a poetic approach to contemporary dance, I introduced the values of this artform, the notion of the body, and the processes that take place in a performance encounter.

Chapter 2 was dedicated to the analysis of the discourse on dance and knowledge while chapter 3 delved into two articles that explicitly address epistemological issues concerning dance. A critical evaluation resulted in a clearer understanding of the challenges in this

endeavor. These consist of reproducing the gap between theory and practice while at the same time arguing for an epistemology that overcomes such dualisms.

Turning to the cognitive sciences, I assessed three lines of inquiry: embodiment theory, enactivism, and neuroaesthetics of dance. Each of these subfields provides either solutions (embodiment), informative frameworks (enactivism), or support (neuroaesthetics of dance) for approaching an epistemology of contemporary dance. In my analysis of strands within cognitive science, I have given examples of how the different disciplines could contribute to an epistemology of contemporary dance. I will summarize them here briefly.

Embodiment theory argues consistently for the body-mind unity by showing how our understanding of abstract concepts is rooted in our bodily experience. It therefore advances the former attempts of formulating an epistemology of dance. Instead of conceptualizing these supposedly opposed modes of knowledge as mutually exclusive, embodiment theory demonstrates how abstract reasoning is dependent upon bodily experience. Instead of following Klein's (2007) proposal of formulating a physical theory of knowledge, I suggest pursuing the project of an embodied theory of knowledge. Such an account strongly suggests that knowledge is not a result, rather, knowing is actualized constantly and understood in its processuality.

Following Parviainen's epistemological framework, I have turned to enactivism and its key concepts to substantiate her claims and ground her framework in a biological theory of understanding. Drawing on enactive social cognition research enabled a more detailed characterization of the performance encounter based on unidirectional incorporation, resonance, and interaction as orientation. Enactive aesthetics confirmed Brandstetter (2007) who claims that with contemporary dance we enter the zone of non-knowledge while specifying her metaphor by using the notion of sense-making. I argue that understanding in art can mean being tossed into the unknown, experiencing an oscillating movement between what I propose to term recognizing, de-cognizing and cognizing. Experiencing contemporary dance is not about being in one of those states; rather, it is based on moving from one state to another and achieving understanding eventually, yet not necessarily.

Neuroaesthetic findings can support philosophical dance aesthetics as they confirm the phenomena of affective and motor resonance. Moreover, the trend of the field is directed towards carrying out research in live settings and combining neuroscientific data with phenomenologically informed interview methods. Audience research takes interest in the experienced sense-making processes of the participants as an integral aspect of the aesthetic experience. Finally, the importance of interdisciplinary collaboration between the humanities and science is emphasized. Given the recent developments in this field, I consider

neuroaesthetic research as a valuable collaboration partner for the envisioned epistemological project on contemporary dance.

The declared aim of this project was to enliven the discussion on dance and knowledge that has unfortunately ceased despite interesting proposals and concepts. Time will show if that goal can be obtained. However, I do hope that doors will open for future research since this thesis only laid the initial foundations for an epistemology of contemporary dance.

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