Concept

MEi:CogSci Master's Thesis

1 General information

Title	The Study of Dance as an Art Form in Cognitive Science
Subtitle (if applicable)	A Paradigmatic Turn?
Keywords	Dance studies, paradigm shift, epistemic cultures, tacit knowledge, neuroaesthetics
Main research area	Dance aesthetics, theory of science, neuroaesthetics
Disciplines involved	Philosophy, neuroscience, cognitive science, dance research, cultural studies
Target group	Dance scholars, performance philosophers, cognitive scientists, movement researchers

2 Author/student information

Name, academic title	Christina Regorosa, BA
Student ID number ("Matrikelnummer")	a01049894
Degree program code ("Studienkennzahl")	A 066 013
E-mail	a01049894@unet.univie.ac.at
Telephone	+43-699-12613957
Date of birth	23rd June, 1980
Study program completed, university:	Dutch Studies, University of Vienna
Study program enrolled, home university:	MEi: CogSci, Dept. Philosophy and Education, University of Vienna

3 Supervisor information

Name	Dr. habil., Mag. Arno Böhler
Affiliation (university, department)	University of Vienna, Department Philosophy and Education
E-mail	arno.boehler@univie.ac.at

4 Thesis objectives

4.1 Extended abstract (max. 3000 characters)

Traditionally, in the humanities, the study of dance as art form has been neglected. In philosophy, it is considered as under-represented in aesthetics, and dance research as a scientific discipline in its own right has only been established at the end of the last century. Possible reasons are the marginalized position of dance in the system of fine arts and in cultural institutions, and the problematic relationship between the ephemeral character of movement and written text. However, over the last decades the scientific interest in dance is increasing.

In cognitive science, dance has entered the scene in interestingly diverse ways. Firstly, the perception of dance is studied the field of neuroaesthetics, in which the neural bases of aesthetic experiences are investigated. Secondly, it is used by various philosophers as a metaphor for thinking, supporting embodied and enactive approaches of cognition. Thirdly, the growing number of researchers with a dual background (dance and science) as well as recent collaborations between scientists and dance artists show that the interest is mutual, and the encounters are enriching.

According to Brandstetter (2007), these developments can be understood as a profound challenge to our understanding of knowledge: Dance – studied as a phenomenon - subverts a binary mode of thinking that poses body versus mind, emotionality versus rationality, and theory versus practice. By doing so, dance ultimately questions our notion of science, and therefore might have the potential to evoke a paradigm shift.

In my master thesis, I will - from a perspective of theory of science - argue that the interdisciplinary investigations on dance within the field of cognitive science can bridge the gap between the humanities and exact sciences. By analyzing current scholarly investigations on dance in cognitive science and focusing on their research paradigms and its implicit assumptions about knowledge, I aim at substantiating my hypothesis. By drawing on theories of cognitive science (neurophenomenology, enactivism), I will hypothesize that the study of dance might cause a paradigm shift by revisiting the corporeal turn – but this time including the human body not merely in terms of theory.

For my endeavor, I will first have to clarify concepts concerning knowledge, epistemic cultures, and paradigm shift theory to establish a theoretical and a methodological framework regarding dance as a practice and dance as a research object. Secondly, I will discuss selected research projects from the fields of philosophy, neuroaesthetics and cognitive science. Finally, I will lay out my hypothesis and propose a view in which an interdisciplinary scholarly focus on dance implies a paradigm shift that on the long run may result in a reconceptualization of the relationship between the humanities and the exact sciences.

4.2 Detailed objectives

4.2.1 Review of topic

The line of dance research, that is interested in the relationship between dance and knowledge, connects very well to cognitive science paradigms such as Embodiment and Enactivism. In cognitive science, dance has entered the scene in interestingly diverse ways. Firstly, the perception of dance is studied in the field of neuroaesthetics investigating the neural bases of aesthetics experiences. Secondly, it is used by various philosophers as a metaphor for thinking, supporting embodied and enactive approaches of cognition. Thirdly, the growing number of researchers with a dual background (dance and science) as well as recent collaborations between scientists and dance artists show that the interest is mutual, and the encounters are enriching.

What makes dance an exceptional research object? According to Brandstetter (2007), these developments can be understood as a profound challenge to our understanding of knowledge: Dance – studied as a phenomenon - subverts a binary mode of thinking that poses body versus mind, emotionality versus rationality, and theory versus practice. By doing so, dance ultimately questions our notion of science, and therefore might have the potential to evoke a paradigm shift.

I envision this paradigm shift as a corporeal turn that includes the living human body, and the lived experience in scholarly discourse, instead of merely including the body as a theoretical construct.

4.2.2 Research question(s)

Can the study of dance evoke a paradigm shift in the respective subfields of cognitive science? What are the characteristics of dance as Western artform if considered an epistemic culture? What kind of knowledge is generated on dance as research object, and what kind of knowledge do contemporary dance practices generate? Which research groups already incorporate dance in their scientific interests? How and why? What is it that dance adds to their understanding of their discipline, and thus, of science?

4.2.3 Hypotheses

Traditionally, dance as a Western art form has been a marginalized topic in scientific discourse. However, in the last decade the scholarly interest in dance has increased significantly. This is not merely bound to dance research programs and curricula. Also, scientific disciplines, such as philosophy, neuroscience, and cognitive psychology address dance and use it for scholarly purposes. My hypothesis is driven by Brandstetter's question: can the study of dance as an art form evoke a paradigm shift? I will assume that this is possible and analyze three research groups/programs/projects accordingly. My hypothesis is that research on dance might bridge the gap between the humanities and exact sciences on the long run.

4.2.4 Theoretical and methodological concepts

Theory of Science
Epistemic cultures
Paradigm shift theory
Epistemology (Tacit/Implicit Knowledge)

4.2.5 Methods

Discourse Analysis
Close Reading
Literature review

4.2.6 Expected insights and findings

- General overview on dance research in cognitive science
- The exemplary analyses will give an insight into the epistemic cultures of the respective disciplines
- The question whether the study of dance has an impact on science should be answerable.
- If that is the case, scenarios of how this impact might turn out should be possible to sketch.
- It may serve as a case study for identifying a paradigm shift that bridges the gap between humanities and nature sciences.

4.2.7 Interdisciplinarity

The interdisciplinary character of my thesis is given structurally and theoretically by taking dance research as departure point for investigating research in two subfields of cognitive science and framing the investigation with theories of science. Moreover, aesthetics is at the core of the two subfields of interrogation: dance aesthetics in philosophy and neuroaesthetics in cognitive neuroscience.

4.3 References

Alarcón, M. (2006). Einführung in die Philosophie des Tanzes. In M. Fischer (Ed.), *Philosophie des Tanzes*: *Denkfestival - eine interdisziplinäre Reflexion des Tanzes* (pp. 7–12). Freiburg: Fördergemeinschaft wiss. Publ. von Frauen FwPF.

Andersen, H., Barker, P., & Chen, X. (2006). *The cognitive structure of scientific revolutions*. Cambridge: Cambridge University Press.

Badiou, A. (2005). *Handbook of Inaesthetics* (Meridian). Stanford, California: Stanford University Press.

Bermúdez, J. L. (2010). *Cognitive science: An introduction to the science of the mind*. Cambridge: Cambridge Univ. Press.

Bickle, J. (Ed.). (2009). *The Oxford handbook of philosophy and neuroscience*.

Bird, A. (2000). *Thomas Kuhn* (Philosophy now). Chesham: Acumen.

Birringer, J. H., & Fenger, J. (Eds.). (2005). *Tanz im Kopf: Dance and cognition* (1st ed., Jahrbuch Tanzforschung, 15.2005). Münster: LIT.

Bläsing, B., Calvo-Merino, B., Cross, E. S., Jola, C., Honisch, J., & Stevens, C. J. (2012). Neurocognitive control in dance perception and performance. *Acta psychologica, 139*, 300–308 (2012). doi:10.1016/j.actpsy.2011.12.005

Bläsing, B., Puttke, M., & Schack, T. (2012). *The neurocognition of dance: Mind, movement and motor skills* (1st ed.). Hove u.a.: Psychology Press.

Brandstetter, G. Dance as Culture of Knowledge: Body Memory and the Challenge of Theoretical Knowledge. In S. Gehm, P. Husemann, & K. v. Wilcke (Eds.), *Knowledge in Motion*: *Perspectives of Artistic and Scientific Research in Dance* (pp. 37–48, TanzScripte, Vol. 9).

Brandstetter, G. (2007). Tanz als Szeno-graphie des Wissens. In G. Brandstetter & C. Wulf (Eds.), *Tanz als Anthropologie* (pp. 84–99). München: Fink.

Brandstetter, G. (2015). *Poetics of dance: Body, image, and space in the historical avant-gardes* (Oxford studies in dance theory). New York, NY: Oxford University Press.

Brandstetter, G., & Klein, G. (Eds.). (2014). *Dance [and] Theory* (TanzScripte, Vol. 25). Bielefeld: transcript Verlag.

Bresnahan, A. (2016). The Philosophy of Dance. The Stanford Encyclopedia of Philosophy. https://plato.stanford.edu/entries/dance/. Accessed 6 May 2017.

Brook, A., & Akins, K. (Eds.). (2005). *Cognition and the brain: The philosophy and neuroscience movement*. Cambridge: Cambridge University Press.

Bunker, J., Pakes, A., & Rowell, B. (Eds.). (2013). *Thinking through dance: Philosophy of dance performance and practices*. Binsted, Hampshire: Dance Books.

Burzynska, A. Z., Finc, K., Taylor, B. K., Knecht, A. M., & Kramer, A. F. (2017). The Dancing Brain: Structural and Functional Signatures of Expert Dance Training. *Frontiers in human neuroscience, 11*, 566 (2017). doi:10.3389/fnhum.2017.00566

Chatterjee, A. (2011). Neuroaesthetics: a coming of age story. *Journal of cognitive neuroscience, 23*, 53–62 (2011). doi:10.1162/jocn.2010.21457

Chatterjee, A., & Vartanian, O. (2014). Neuroaesthetics. *Trends in cognitive sciences, 18*, 370–375 (2014). doi:10.1016/j.tics.2014.03.003

Chatterjee, A., & Vartanian, O. (2016). Neuroscience of aesthetics. *Annals of the New York Academy of Sciences, 1369*, 172–194 (2016). doi:10.1111/nyas.13035

Clark, A. (2001). *Mindware: An introduction to the philosophy of cognitive science*. New York: Oxford University Press.

Collins, H. (2010). *Tacit and Explicit Knowledge*. Chicago: University of Chicago Press.

Cross, E. S., & Ticini, L. F. (2012). Neuroaesthetics and beyond: new horizons in applying the science of the brain to the art of dance. *Phenomenology and the Cognitive Sciences, 11*, 5–16 (2012). doi:10.1007/s11097-010-9190-y

Di Cinzia, D., & Vittorio, G. (2009). Neuroaesthetics: a review. *Current opinion in neurobiology, 19*, 682–687 (2009). doi:10.1016/j.conb.2009.09.001

Dietze, E. v. (2001). *Paradigms explained: Rethinking Thomas Kuhn's philosophy of science* (1st ed.). Westport, Conn. [u.a.]: Praeger.
Fingerhut, J., Hufendiek, R., & Wild, M. (2013). *Philosophie der Verkörperung: Grundlagentexte zu einer aktuellen Debatte* (Suhrkamp Taschenbuch Wissenschaft, Vol. 2060). Berlin: Suhrkamp.
Fischer, M. (Ed.). (2006). *Philosophie des Tanzes: Denkfestival - eine interdisziplinäre Reflexion des Tanzes*. Freiburg: Fördergemeinschaft wiss. Publ. von Frauen FwPF.
Fischer, M. (2010). *Denken in Körpern: Grundlegung einer Philosophie des Tanzes*. Zugl.: Freiburg (Breisgau), Univ., Diss., 2009 (Alber-Reihe Thesen, Vol. 39). Freiburg im Breisgau: Alber.
Friedenberg, J., & Silverman, G. (2006). *Cognitive science: An introduction to the study of mind*. Thousand Oaks, Calif.: SAGE.
Gascoigne, N., & Thornton, T. (2014). *Tacit knowledge*. Durham: Acumen.
Gehm, S., Husemann, P., & Wilcke, K. v. (Eds.). *Knowledge in Motion: Perspectives of Artistic and Scientific Research in Dance* (TanzScripte, Vol. 9).
Goldman, A. I. (Ed.). (1995). *Readings in philosophy and cognitive science* (2nd ed., A Bradford book). Cambridge, Mass.: MIT Press.
Hagendoorn, I. (2003). The dancing brain. *Cerebrum*(5 (2)), 19–34.
Hagendoorn, I. (2011). *Dance, Aesthetics, and the Brain: Dissertation* .
Harré, R. (2002). *Cognitive science: A philosophical introduction*. London, Thousand Oaks, Calif: SAGE Publications.
Holt, J. (2013). Neuroaesthetics and Philosophy. *SAGE Open, 3*, 215824401350067 (2013). doi:10.1177/2158244013500677
Jacobs Marc D. (Ed.). (2005). *The Blackwell companion to the sociology of culture*. Malden, Mass. [u.a.]: Blackwell Publishing Ltd.
Johnson, M. (2007). *The meaning of the body: Aesthetics of human understanding*. Chicago: University of Chicago Press.
Jola, C., Ehrenberg, S., & Reynolds, D. (2012). The experience of watching dance: phenomenological–neuroscience duets. *Phenomenology and the Cognitive Sciences, 11*, 17–37 (2012). doi:10.1007/s11097-010-9191-x
Katan, E. (2016). *Embodied Philosophy in Dance: Gaga and Ohad Naharin's Movement Research* (Performance Philosophy). London, s.l.: Palgrave Macmillan UK.
Keller, D. (2013). Neuroaesthetics. *The British Journal of Aesthetics, 53*, 125–129 (2013). doi:10.1093/aesthj/ayq012
Knorr Cetina, K. (2005). Culture in global knowledge societies: Knowledge cultures and epistemic cultures. In Jacobs Marc D. (Ed.), *The Blackwell companion to the sociology of culture* (pp. 65–79). Malden, Mass. [u.a.]: Blackwell Publishing Ltd.
Knorr-Cetina, K. (1999). *Epistemic cultures: How the sciences make knowledge*. Cambridge, Mass.: Harvard Univ. Press.
Kuhn, T. S., & Hacking, I. (2012). *The structure of scientific revolutions* (4th ed.). Chicago: The University of Chicago Press.
Lakoff, G., & Johnson, M. (1999). *Philosophy in the flesh: The embodied mind and its challenge to western thought*. New York, NY: Basic Books.
Lauring, J. O. (2014). *An introduction to neuroaesthetics: The neuroscientific approach to aesthetic experience, artistic creativity, and arts appreciation*.
Magnus, P. D., & Busch, J. (Eds.). (2010). *New waves in philosophy of science* (New waves in philosophy). Basingstoke, New York, NY: Palgrave Macmillan.
Margolis, E. (Ed.). (2012). *The Oxford handbook of philosophy of cognitive science* (Oxford handbooks online). Oxford: Oxford Univ. Press.
Minton, S. C. (2016). *Thinking with the dancing brain - embodying neuroscience* : Rowman & Littlefield.
Nadal, M., & Skov, M. (2015). Neuroesthetics. In J. D. Wright (Ed.), *International encyclopedia of the social & behavioral sciences* (2nd ed., pp. 656–663). Amsterdam: Elsevier.
Nancy, J.-L. (2006). Alliterationen. In M. Fischer (Ed.), *Philosophie des Tanzes*: *Denkfestival - eine interdisziplinäre Reflexion des Tanzes* (pp. 89–97). Freiburg: Fördergemeinschaft wiss. Publ. von Frauen FwPF.
Noë, A. (2008). Life is the Way the Animal is in the World: A Talk with Alva Noë. Edge.org. https://www.edge.org/conversation/life-is-the-way-the-animal-is-in-the-world.
Pearce, M. T., Zaidel, D. W., Vartanian, O., Skov, M., Leder, H., Chatterjee, A., et al. (2016). Neuroaesthetics: The Cognitive Neuroscience of Aesthetic Experience. *Perspectives on psychological science: a journal of the Association for Psychological Science, 11*, 265–279 (2016). doi:10.1177/1745691615621274
Peters, S. (Ed.). (2013). *Das Forschen aller: Artistic Research als Wissensproduktion zwischen Kunst, Wissenschaft und Gesellschaft* (Science Studies). Bielefeld: transcript Verlag.
Polanyi, M., & Sen, A. (2009). *The tacit dimension*. Chicago Ill. u.a.: Univ. of Chicago Press.
Rese, F. (2014). *Erfahrung als eine Form des Wissens*. Freiburg: Alber.

Savrami, K. (2017). A duet between science and art: neural correlates of dance improvisation. *Research in Dance Education, 18*, 273–290 (2017). doi:10.1080/14647893.2017.1369509

Scarinzi, A. (Ed.). (2015). *Aesthetics and the Embodied Mind: Beyond Art Theory and the Cartesian Mind-Body Dichotomy* (Contributions To Phenomenology, In Cooperation with The Center for Advanced Research in Phenomenology, Vol. 73). Dordrecht, s.l.: Springer Netherlands.

Schunn, C. D., Gernsbacher, M. A., & Derry, S. J. (Eds.). (2005). *Interdisciplinary collaboration: An emerging cognitive science*. Mahwah, N.J: Lawrence Erlbaum.

Sheets-Johnstone, M. (2015). *The Phenomenology of Dance*. Philadelphia, Pennsylvania: Temple University Press.

Siegmund, G. (2016). Tanz und Wissenschaft: Wissen, was der Körper weiß. Goethe Institut. https://www.goethe.de/de/kul/tut/gen/tan/20710517.html.

Skov, M. (Ed.). (2009). *Neuroaesthetics* (Foundations and frontiers in aesthetics). Amityville NY: Baywood.

Skov, M., Vartanian, O., Martindale, C., & Berleant, A. (2016). *Neuroaesthetics* (1st ed., Foundations and Frontiers in Aesthetics Series). London: Taylor and Francis.

Sparshott, F. E. (2016). *A Measured Pace: Toward a Philosophical Understanding of the Arts of Dance* (Toronto Studies in Philosophy): University of Toronto Press.

Sparshott, F. E. (1983). Why philosophy neglects the dance. In R. Copeland & M. Cohen (Eds.), *What is dance?: Readings in theory and criticism* (pp. 94–102). Oxford, New York, Toronto, Melbourne: Oxford University Press.

Starr, G. G. *Feeling beauty: The neuroscience of aesthetic experience* .

Thagard, P. (2005). *Mind: Introduction to cognitive science* (2nd ed., A Bradford book). Cambridge, Mass.: MIT Press.

Tinio, P. P. L., & Smith, J. K. (Eds.). (2014). *The Cambridge handbook of the psychology of aesthetics and the arts* (Cambridge handbooks in psychology). Cambridge: Cambridge University Press.

Wright, J. D. (Ed.). (2015). *International encyclopedia of the social & behavioral sciences* (2nd ed.). Amsterdam: Elsevier.

5 Structure, outline of chapter titles, and guiding questions

1 Dance research

In this chapter I will draw on three articles of the collection 'Knowledge in Motion' (Gehm et al. 2007) to delineate the research branch of dance studies that focuses on the relationship between dance and knowledge. The departure point for my investigation is the following statement:

> (…) if dance is a ›culture of knowledge‹, i.e. appears and is accepted as a setting for a different type of sensuous, dynamic knowledge, this cannot remain without impact on our general understanding of knowledge and science. Dance would then shift the boundaries of what we consider to be knowledge and science and in doing so begin to set our understanding of knowledge in motion; for example, if we – proceeding on the assumption that dance as the object under investigation cannot be fixed like an immobile object – realise that object blurriness and a temporary structure also affect those artefacts, monuments or test set-ups of knowledge that were presumed to be secure; that a dynamic and contingent relationship between scientist and object of investigation is also being established in other scientific research areas and is changing in the research process: also in disciplines that deal with seemingly fixed objects and reliable results. The notion of truth, the verifiability of test arrangements is put to the test if dynamic reflections inspired by dance touch on or even violate the parameters of scientific perception: for example, by acknowledging that the physical movement, the sensuousness, the researcher's emotion influence the process. (Brandstetter 2007, p. 41)

Whereas the notion of motility and dynamicity is well-established common ground in the humanities (post-structuralism) and in cognitive science (enactivism, dynamic systems theory) by now, stating this hypothesis for the exact sciences seems daring. In fact, by doing so she undermines premises that served for establishing scientific disciplines in general. Brandstetter draws on Kuhn's paradigm theory and poses the question if his theory could be evenly applied to 'dance as an art form of body motion in space and time'. (ibid., p. 42)

1.1 Dance and Knowledge

Before turning to that main research question, we will have to address these questions first: '(…) what knowledge lies in the movement of dance? What do we know about and through (this) movement? And conversely: how does movement work and what effect does it have on our knowledge (…)? (…) what is the specific knowledge of dance? (…) Can this be called knowledge at all?' (ibid., p. 40) What is the mode of knowledge production in artistic dance research? (Borgdorff 2007, p. 74) What is the social status of dance knowledge? (Klein 2007, p. 26)

I will summarize the insights of these dance scholars and compare them in the following subchapters with possible answers from theories of cognitive science. At the end of the chapter I will come up with a theoretical framework for the investigations in chapter 2.

2 Cognitive Science

Theories of cognitive science lend themselves perfectly for this inquiry because its own development from an engineering discipline to the interdisciplinary study of the human mind has been accompanied by meta-philosophical reflections and critical interrogations on the matter of knowledge and science since the rise of neuroscience. For example, the relationship between research data and interpretation of data has been debated a lot and still is a controversial topic in brain science.

I will look for answers on the following main questions: What is scientific knowledge? What is a scientific knowledge culture? What is knowledge in motion? What are the implications of conceptualizing knowledge as dynamic? For each question, I will draw on a particular line of research from cognitive science to establish a theoretical framework.

2.1 Tacit knowledge

Brandstetter characterizes the knowledge that dance produces as implicit knowledge. Drawing on Polanyi (2009), who has coined the term tacit knowledge for describing implicit knowledge, I will address the following questions: Do the characteristics of tacit knowledge apply to dance knowledge? How does tacit knowledge relate to explicit knowledge? How is scientific knowledge defined in this approach?

2.2 Epistemic cultures

Drawing on the concept of epistemic cultures (Knorr-Cetina 1999) and using Knorr-Cetina's analyses of the epistemic cultures in high energy physics and molecular biology, I will approach Brandstetter's notion of dance as an epistemic culture.

Guiding questions are: How is knowledge produced in the respective fields? How is an epistemic culture constituted? What are the obstacles that prevent dance knowledge from being regarded as scientific?

2.3 Paradigm Shift Theory

As already stated above, I will try to tackle the question, whether dance as an art form has the potential to evoke a paradigm shift in science. Besides the argument Brandstetter mentions, namely the position of dance art outside science, - what are the parameters for a paradigm shift according to Kuhn? How is a paradigm shift characterized, and would this characterization apply to the current situation of dance?

3 Neuroaesthetics

I will give an overview on the development of this young discipline that investigates the aesthetic experience from the biological perspective. Using the framework established in chapter 2, I will draw attention to the cultural structure of this scientific methodology: premises of the field, the limitations, the research results, and the implicit notion of knowledge. Furthermore, I am interested in the aims and expectations of researchers in this field and their view on the societal relevance of the knowledge that neuroaesthetics provides.

3.1 Dance and the study of the brain

First, I will demonstrate that dance has gained popularity among brain scientists. Why is that the case? What makes dance, compared to other art forms, an extraordinary case worth studying? What is it that science gains from focusing on dance?

3.2 Project analysis

With these questions in mind and again drawing on my theoretical framework, I will analyze a research project. The selection has to be discussed and is still subject to change.

4 Philosophy

In this chapter I will briefly provide a historical account on dance as a philosophical object of inquiry and sketch out the difficulties and challenges of a philosophy of dance (based on my preliminary study project 'Philosophy of Dance. Body, Knowledge, and Subjectivity').

In the following subchapters I will present philosophical projects that deal with dance and analyze the consequences for philosophy in general. Guiding questions are: what is the impact of dance on philosophical inquiry and methodology? What does dance as a metaphor and as a practice add to the conceptualization of philosophy as science?

4.1 Phenomenology

As Fischer (2010) points out it was only through the phenomenological project that integrated the body as a core aspect in its thinking, that dance could enter the philosophical realm of inquiry. What are the main thinking figures proposed in this line of research? I will be referring to concepts such as the thinking body.

4.2 Aesthetics

One possible consequence of approaching dance as a philosopher is to collaborate with dance artists or movement researchers. I will analyze Jean-Luc Nancy's text 'Alliterations' from the dance piece with the same title in which he performed together with Mathilde Monnier. I will compare his approach to dance aesthetics with insights from neuroaesthetics.

4.3 Enactivism

Alva Noë uses dance as a metaphor for consciousness. His theory of sensorimotor enactivism fits the dance paradigm well. He too engaged in collaborations with dancers, e.g. Lisa Nelson. However, to my knowing he has not yet laid out his understanding of dance in an academic context. I will hypothesize about possible reasons.

5 Conclusion

In this chapter I will summarize my analyses and emphasize important findings. Subsequently, I will consider these under the light of my hypothesis and argue that cognitive science provides well-suited research paradigms for dance to be included as a scientific important topic. I will also outline a possible scenario that the study of dance might evoke – bridging the gap between humanities and natural sciences as proposed by neurophenomenology.

6 Working plan and schedule

Working-package (WP)	**Start**	**End**	**Activities**	**Resources required**	**Mile-stones (M)**
WP 1	1.7.2018	31.7.2018	Finding literature Organize literature in Citavi Master Thesis Concept		M1
WP 2	1.9.2018	30.9.2018	Reading and writing Formal Procedure		M2
WP 3	1.10.2018	28.2.2019	VO Knowledge Creation SE Applications of fMRI Reading and writing Individual sessions „Schreibmentoring“ (CTL)		M3
WP 4	1.3.2019	30.4.2019	VO Introduction to Neuroscience Reading and writing SE Master Thesis (MEi:CogSci): present and discuss MA-Thesis SE Konversatorium (Böhler): present and discuss MA-Thesis		M4
WP 5	1.5.2019	30.6.2019	Writing TQW Doc: present MA-Thesis MEi:CogSci students conference: present MA-Thesis		M5

6.1 Milestones and results/"products"

Mile-stone	**Result/"product"**
M1	Master Thesis Concept
M2	Introduction Chapter 1: Dance Research (ca. 10 pages)
M3	Chapter 2: Theory of Science, Cognitive Science (ca. 20 pages) Chapter 3: Neuroaesthetics (ca. 30 pages)
M4	Chapter 4: Philosophy (30 pages)
M5	Chapter 5: Conclusion (ca. 30 pages)

7 Reflection

7.1 Paradigm(s)

Cultural Studies (epistemic cultures)
Embodiment
Enactivism
Philosophy of dance

7.2 Premises

Embodiment/phenomenology – the thinking body, thinking in movement
Social Constructivism of Science – scientific knowledge is socially constructed through cultural practices
Enactivism – perception is action, thus, aesthetics is establishing meaning, performing art is meaning enacted
Neurophenomenology – both first person data and third person data should be considered in research design

7.3 Learning interest

I am interested in the interdisciplinary study of dance. Being a dancer myself, I aim at reflecting the scholarly and societal role of dance as an art form (contemporary dance in particular), gain an informed understanding of the educational role that dance as a practice might play, and last but not least, find a clear stance as a dancer in science.
What exactly can a dancing scientist contribute to a field that intertwines theory and practice, in what ways and why would that be relevant for society? These are the meta-questions that thrive my motivation for my master thesis topic.
Finally, I do think of my master thesis as a useful tool to build expertise for my further professional career. I plan to translate my master thesis in a format that is known as performance lecture. Furthermore, parts of my thesis could inform a concept for art education focusing on contemporary dance.

7.4 Limitations

Given the scope of the master thesis, I have to carefully select cases or be rather short on some parts of chapters (probably the introductions to the paradigms or disciplines at hand).
My project could be questioned by scholars who are not familiar with contemporary dance, its aesthetics and history, and therefore, underestimate the role of dance as relevant artform.

7.5 Open questions

The open question, that will remain, is: how exactly would a paradigm shift evoked by dance knowledge turn out in exact sciences? Would it change the epistemic culture of exact sciences and if so, how? I cannot give an answer to that question.

I consider my master thesis as an attempt of approximation to an answer, since neuroaesthetics is based on psychology, neuroscience, fMRI (physics), and statistics.

7.6 Weak points

For my master thesis I considered doing an internship at the SOBA (Social Brain in Action) at Bangor University to get hands-on experience on neuroaesthetic research. The SOBA is the research group in which Emiliy Cross is investigating neuroaesthetics of dance. Immersing in the research culture of neuroaesthetics would have been beneficial for my thesis. Unfortunately, this is not possible due to organizational and financial reasons.

So, the weak point is that it is solely theoretical work.

7.7 Failure criteria

The danger of an interdisciplinary endeavor is eclecticism. If I cannot manage to argue my thoughts stringently, even though they have to cross disciplinary or paradigm boundaries, then I would have failed.

7.8 Novelty

The innovative character of my thesis is given by addressing a question posed in dance research and investigating it in two subdomains of the field of cognitive sciences. Thanks to the interdisciplinary education and my background as practitioner I am able to take various perspectives on the topic. This enables a synthetic study of the current developments of dance research even though they are framed with differing paradigms.