PhD proposal

> "*A stabilized body image or imaginary anatomy, a consistent and abiding sense of self and bodily boundaries, requires and entails understanding one's position vis-à-vis others, one's place at the apex or organizing point in the perception of space*" (p.48, Elizabeth Grosz, 1994).

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1. Name of candidate, name of desired supervisor(s)

Name of candidate: Carolien Hermans
Desired promoters: Folkert Haanstra, Liesbeth Wildschut

2. Title of the project

'Dance education for children with special needs: mirroring, kinaesthetic empathy and mindblindness'

3. Introduction

Recently there has been a renewed focus on the active participation of disabled children within the arts in The Netherlands. This has resulted in a growing number of art initiatives in the field as well as a growing number of conferences and symposia addressing this issue.[1] However inclusive art is still almost an unexplored terrain in The Netherlands. Hardly any experimental nor theoretical studies have been performed within a Dutch context that give insight in the effects of art and dance education for children with a disability. This is in hard contrast with the vivacious and often very inspiring research and dance initiatives that can be found abroad.

In this research proposal I will focus on dance education for children with special needs. The proposed research combines theoretical research with an experimental study. The following hypothesis will be tested: *children with mindblindness and an impaired ToM can be stimulated by intensive dance education.*

The often impaired kinaesthetic empathy in autistic children, deaf children and children with conduct disorders might be ascribed to problems in reading the minds of others, often referred to as the Theory of Mind (ToM) These children encounter difficulties in imitating and mirroring the physical intentional actions of others, due to a possible malfunctioning of the mirror neurons. The recent discovery by neuroscientists of mirror neurons reveal that 'identical sets of neurons can be activated in an individual who is simply witnessing another person performing a movement as the one actually engaged in the action or movement' (Gallese et al, 1998 and 2000). The mirror neurons are associated with imitation, empathy and intersubjectivity.

The question thus becomes whether the kinaesthetic empathy in children with autism, deaf children and children with conduct disorders can be stimulated by dance education through the use of mirroring

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[1] The following conferences took place in 2009:

1. In march 2009 the conference on 'Art education for people with a disability' was held at the SKVR, Rotterdam with the following partners: the Flamish Ministry of Education, The Dutch Ministry of Education, Culture and Science, Kunstconnectie, SKVR and Cultuurnetwerk.
2. The annual 'Day of Cultural Organisation', organised by CANON and Cultuurnetwerk, focussed in 2009 on special education.
3. Kunst Inclusief organised in May 2009 a day around inclusive art.

techniques, often used in Dance/Movement Therapy. This mirroring embodies the "quality of feeling of a shared affect state, not necessarily imitating the exact behavioural expression of the (other's) inner state" (Berrol, 2006, p.2). It is comparable with Laban's system of Effort/Shape, the matching of the other's movements and actions may be represented by qualitative elements of intensity, duration, spatial shape, tempo and/or rhythmic pattern.

My research proposal consists of two phases. In the first phase I will develop a theory of kinaesthetic empathy and mirroring techniques as a useful tool in DM/T for children with special needs. The second phase is an experimental study. In this experimental study I will test the hypothesis that autistic children with mindblindness and an impaired ToM can be stimulated by intensive dance therapy. This hypothesis will be tested in a Pretest-Posttest Control Group Design, where autistic children in the age of 6-9 years receive an intense dance therapy and are compared with a control group.

4. Phase 1: theory

4.1. Description of the project, research question and central aims

Today it is a more and more accepted thesis that human beings perceive, learn and experience through bodily movement. Elizabeth Grosz states in Volatile Bodies (1994) that "any adequate model must include a psychical representation of the subject's lived body as well as of the relations between body, gesture, posture, and movement in the constitution of the processes of psychical representations" (p.23). In that way our bodies are the foundation for the way we experience and interact with our surroundings (Fogtmann, 2009). The body thus is not only considered as the centre of action, but also as centre of all meaning-giving processes.

Since it is precisely through the body that we have access to the world, bodily and sensorial processes play an important role in the construction of a sense of self. In this PhD research I will argue that kinaesthetic empathy is crucial in the interplay between self and other and thus a useful tool in DM/T for children with special needs.

Kinesthesis or kinaesthesia is the perception of the position and movement of one's body parts in space[2]. Kinesthetic empathy refers to the experience of spectators that, even while sitting still, they feel they are participating in the movements they observe, and experience related feelings and ideas (Wildschut, 2003/2009). An important source for the concept of kinesthetic empathy is Theodor Lipps' theory of 'Einfühlung' (1913) and John Martin's concept of inner mimicry (1939). Martin states that the spectators not only watch the movement, but also participate in it and in this process the spectators experience the same emotions as the dancers[3].

Recent evidence in cognitive science can help to understand the process of kinesthetic empathy. Rizzolatti et al. discovered some year ago a population of neurons in the premotor cortex of a monkey that discharge both when the monkey performs a movement and when it observes the same action performed by someone else (Rizzolatti et al., 1996 and 2001; Gallese et al., 1996). This mirroring in the brain is not solely a pure copying of some-one's actions, it is a subjective interpretation of someone else's act. Mirror neurons play a role in the mirroring of postures, facial expression and moods of others (Williams et al, 2009).

[2] Kinesthesis is part of the sensory capacities dealing with bodily perception and is part of the somatosensory system. The somatosenory system is conscious bodily perception which includes all skin sensation, proprioception, and the perception of the internal organs. When talking about Kinesthetic Interaction, the proprioception is often included because both kinesthesis and propriorception deal with the perception ofbodily movement. The difference between the two is that kinesthesis is kinetic motion, while the proprioception is the sensory faculty of being aware of the position of the limbs and the state of internal organs. It is the bodily intelligence that allows us to react intuitively without having to think about every single movement (Fogtmann).

[3] However, Martin's theory of kinesthetic empathy has been criticised on the grounds that it 'denies difference' (Foster 1998) and 'universalises the personal and essentialises the irrational' (Franko 2002).

The concepts of kinesthetic empathy and inner mimicry are not only applicable to the situations where spectators are watching a performance, they also apply to dance education and education in general. Since dance is indeed a kinesthetic art which can be experienced in the entire body, it is crucial to reassess the role of kinesthetic empathy in the education of dance, in specific dance education for children with special needs.

In this research proposal I will focus on the following groups of children with special needs: 1) children with autism, 2) children with prelingual hearing loss and 3) children with a conduct disorder. My main focus will be on autistic children, however, I will also use additional developmental theories of children with a prelingual hearing loss and childen with a conduct disorder, to create a broader context and perspective.

These three groups of children are specifically chosen. Children with autism, children with a conduct disorder and children with prelingual hearing loss all show deficits in constructing a theory of mind, ToM (Frith et al, 1994; Lueger and Gill 1990; Pennington and Bennetto; 1993; Peterson and Seigel, 1997).[4] ToM refers to the capability of "being able to infer the full range of mental states (beliefs, desires, intentions, imaginations, emotions etc.) that cause action. In brief, to be able to reflect on the contents of one's own and other's mind" (p.3, Baron-Cohen, 2000), specifically the intentions of other minds [5]. ToM is closely related to imitation. Williams (2009) suggests that deficits in imitation might be attributed to early developmental failures of mirror-neurons systems. [6]

4.2. Aim and detailled workplan

In the first phase of my research project I will develop a theory of kinesthetic empathy as a crucial tool for dance education for children with special needs. Profoundly interdisciplinary it will integrate theories om empathy and intersubjectivity within cultural studies (Lipps, 1913; Martin, 1939; Bleeker, 2008; Foster, 1986; Wildschut, 2003 and 2008), theory on imitation in clinical psychology (Baron-Cohen, 1997-2000; Nadel and Butterworth, 1999), and the theories on mirror neurons, embodiment and agency within the field of neuroscience and cognitive science (Williams, 2009; Gallese, 1996-2000; Rizzolatti, 1996-2001).

The first chapter of my project concerns the key term 'kinaesthetic empathy'. I will historically trace back the concept within dance and theatre studies to Martin's notion of 'inner mimicry' and Theodor Lipps' theory of 'Einfühlung'. Alhough strongly attested Martin's concept is still relevant today. Furthermore I will include theories on empathy (Frijda, 1988), facial expression and emotion (Ekman, 1998) and research on the decoding of emotional meaning in expressive body movement. Furthermore the concepts will be explained through the use of recent findings in the field of cognitive science where the following concepts play an important role: body image, agency, intentionality and proprioception.

The second chapter is concerned with imitation. Main issue is how children can connect the felt but often unseen movements of the self with the seen but unfelt movements of the other (Meltzoff and Moore, 1999).How do closely co-ordinated representations of self and other typically develop, and how that this go so awry in autism, in children with prelingual hearing loss and children with a conduct disorder? Theories of Meltzoff (1990), as well as the cross-modal model of Barresi and Moore (1996),

[4]An interesting finding of Peterson and Seigel (1997) was that deaf children with fluently signing deaf family did not show any ToM deficit in contrast to deaf childeren from hearing families. These results point very clearly to the negative impact which conversational deprivation has on ToM.

[5] Intentionality is defined as the capacity of something to refer or point to things other than itself (Baron-Cohen, p.73, 2000).

[6] The imitation theory can explain other deficits in autism that the ToM cannot account for. The imitation theory can also account for other deficits in autism, like the 1) repetitive and stereotyped behaviors and speech, 2) difficulties in planning ability and attentional shifting ,3)abnormalities in postural control, motor skills and coordination and 4) insistency on sameness(Rogers, 1999).

and the evolutionary viewpoint of Tomasello (1993) will be discussed. Imitation here will be considered not as mindless or automatic but as effortful, intentional acts (Meltzoff and Moore, 1999).

The third chapter will describe developmental notions of imitation in infancy, as well as the different stages of the Theory of Mind. I will describe the precursors of ToM (Baron-Cohen, 1997), namely Intentionality Detector (ID), Eye-Direction Detector (EDD), Shared-Attention Mechanism (SAM) and ToM. I will explore the triadic relationship between ToM, imitation and MN's (mirror neurons). In developmental terms I will also incorporate Lacan's notion of the mirror stage (1989) as a powerful mechanism, the formation of the Ego via the process of identification, the Ego being the result of identifying with one's own specular image and the first entry to the world of the others.

The fourth chapter will focus on children with special needs. I will decribe in depth developmental issues related with 1) autism, 2) prelingual hearing loss and 3) conduct disorder. The aim is to present evidence which points to theory of mind deficits in other developmental disorders. In doing so, I will keep in mind the following question: Is a selective deficit in ToM exclusive to autism? And if not, in what ways are these disorders related? How are other socio-cognitive deficits, like for example repetitive and stereotyped behaviors, related to the ToM? Can they be explained by possible deficits in the mirror-neurons?

In the fifth chapter I will draw conclusions from the above chapters. Specifically here I will discuss (cultural) critics on concepts from previous chapters (such as mimesis, inner mimicry, intentionality, mirror stage, theory of mind). I will argue that these concepts are never completely universal or natural given, they are the result of bodily, perceptual processes together with cultural conditioning processes. I will use Foster (1986), Grosz (1994) and Bleeker (2008) to shed light on the powerful social and discursive practices that are implied in al these concepts[7].

The sixth chapter finally, will discuss the implications for developing a framework for dance education for children with special needs. The Laban Movement Analysis will be useful to incorporate several aspects of the moving body, namely: effort, shape, body and space. In this chapter I will also pay attention to the mirroring techniques developed by Marian Chase in Dance/Movement Therapy. Chase makes an important distinction between mimicry and mirroring of action. "Mimicry would be simply copying the form of the movement without incorporating its meaning. Mirroring of action and meaning, also referred to as kinesthetic empathy or empathic reflection, is one of the major contributions that Chase made to dance therapy (see Wildschut, p.43, 2003). Furthermore I will include the Do-As-I-Do method (Custance, Whiten and Bard, 1995) in which children with autism are systematically trained to produce imitative movements.

5. Phase two: the experimental study

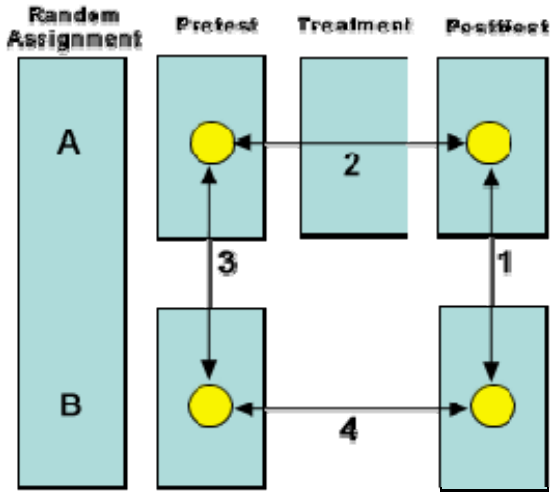
5.1. Research question

In an experimental study I will test the hypothesis that autistic children with mindblindness and an impaired ToM can be stimulated by intensive dance therapy. This hypothesis will be tested in a Pretest-Posttest Control Group Design, where autistic children in the age of 6-9 years receive an intense dance therapy and are compared with a control group.

[7] Kinesthetic empathy will emerge as a social-cultural conditioning process, always in the process of becoming. It will be considered as a product of discursive and bodily performativity. I will therefore critically analyse the universal claim that not only underlies Martin's concept of inner mimicry, but also underlies the theory of facial expression (Ekman) and ToM (Vinden and Astington, 2000). Vinden and Astington state; 'it is by virtue of growing up within Western culture that children acquire our theory of mind'(p.509, 2000). The work of Hobson (1993) will be useful in analysing the ToM in terms of something that is cultural conditioned.

5.2.Methods

The research design method is Pretest-Posttest Control Group Design. In this method two randomized groups are tested before treatment to determine prior state, one is given treatment, the other group not. The posttest measures are taken on both groups to compare change. This research method is a true experimental design in that there is a degree of randomization, use of a control group, and therefore greater internal validity. This design is one of the best and most practical to assess the impact of an intervention or treatment on two randomized groups, one control and one treatment.



Equation 1: shows how the group with dance therapy differs from the control group.
Equation 2 and 4: show the differences between pretest and posttest.
Equation 3: shows the randomness of the selection.
Equation 4: shows the differences due to the time between the pretest and post test situation.

5.3. Study population

The experimental study will take place in Kinderhuis Reek, a residential institution for autistic children. The children (n=20) will be randomly assigned to the dance therapy and the control group. The children in the treatment group will receive an intensive, individual dance therapy (three times a week, in a period of three months). Selection criteria: high functioning autism (e.g. normal intelligence) with an age between 6-9 years.

5.4. Coders and trainers

In the experimental phase I will work together with students from the Fontys Dansacademie, specialised in dance therapy, and students from the master Art Education, School for the Arts in Amsterdam. The students of the Fontys Dansacademie will be trained to give the dance therapy to the autistic children. The students from the master Art Educaton will be trained as coders.

5.5. Hypothesis

I will test the hypothesis that mirroring techniques in intensive D/MT stimulate a greater (kinaesthetic) empathy in autistic children. In order to operationalize the term kinaesthetic empathy properly, I will make the following distinction in type of movements: 1) actions (purposeful actions), 2) abstract movements (non-purposeful), 3) expressive/symbolic movements.

In line with the research findings of Williams (2009) I will pay attention to the following problematic aspects in autistic children:

- Imitation of meaningless gestures/movements appears to be more affected than imitations of actions;

- Autistic children have problems in translating the perspective of the other[8];
- Imitation of movement sequences is more difficult then single actions.

This leads to the following assumptions (in line with the research findings of Hertzig, Snow and Sherman, 1989):

1. Autistic children in the experimental study will be able to identify simple (single) basic actions (jump, walk, run) and meaningful actions like eating, drinking, sleeping, however they will show problems in identifying emotional displays.
2. Autistic children will be able to imitate concrete actions on real objects, both immediately as well as deferred in time, however they will have problems in imitating abstract movements and expressive/symbolic movements.
3. Autistic children will have problems in identifying emotional expressive movements of the dancer (sad, happy, angry) and will also show problems in imitating emotional expressive movements.

All subjects (in the treatment group as well as the control group) will be tested before and after the dance therapy by a group of coders, using a test instrument and an observation list. The children in the treatment group will then receive an intensive individual dance therapy. This dance therapy will be based on the mirroring techniques developed by Marian Chase in Dance/Movement Therapy and the Do-As-I-Do method. Specific attention will be paid to the transition from a concrete action to an abstract movement phrase, furthermore in all movements the trainer will give constantly feedback about 'how do you move' /'how do I move' and 'how do you feel'/'how do I feel'. The dance therapy will be informed by the theoretical framework which I will develop prior to the experimental phase.

The main hypothesis will then be tested, namely 'mirroring techniques in intensive D/MT stimulate a greater (kinaesthetic) empathy in autistic children'.

The individual dance therapy will be given by a group of dance students from the Fontys Dansacademie, specialised in dance therapy. The dance therapy will consist of a recognizable structure, with a clear distinction between basic actions (jump, fall, walk, turn etc.), meaningful movements (drink, sleep, eat, brush your teeth etc.) and expressive movements (sad, angry, happy, fear etc.). Every session will have a recognizable structure: welcome-working-saying goodbye and also the constant shift from watching, imitating and moving together simultaneously will be worked out in detail (in close relationship to the theoretical findings).

5.6. Test instrument and observation list: inter-rater reliability and content validity

Numerous test and observation instruments have been developed to measure different aspects of autism, such as 1) Kidies[9], 2) Autism Diagnostic Observation Schedule, 3) Fefa [10] and 4) ToM-Test[11] and of course many more. However there is not one test or observation list available that is directly applicable to my research questions. Therefore I will combine a test with an observation list.

This test-instrument will be developed in line with the research of Hertzig and colleagues (1989). The subjects will be tested on visually identifying 9 pictures: three of basic actions, three of meaningful/purposeful movements and three of an emotional/expressive movements. First, the subjects will be asked to identify the picture and to select pictures on the basis of descriptions of the content. Secondly, a live dancer will perform these nine actions/movements. Again the subjects will be asked to identify the movement, to imitate the movements themselves and to enact the movements

[8] For example, in copying the action of holding the hands up palm away, grasping the thumb with the other hand, autistic subjects tended to hold up their palm towards themselves recreating the hand view they had seen instead of translating the perspective of the other (Williams, 2009; Rogers, 1999; Whiten and Brown, 1999).

[9] The kiddie-infant descriptive instrument for emotional states (KIDIES): An instrument for the measurement of affective state in infancy and early childhood.

[10] Frankfurt Test and Training of Facial Affect Recognition.

[11] A New Instrument For Assessing Theory of Mind in Normal Children and Children with Autism.

when verbally directed. Lastly the subjects will be asked to identify the emotions (sad, angry, happy) displayed by the dancer, not only asking 'what do you see', but also 'how does the dancer feel' and 'how do you feel?' Needless to say, that this test-instrument will be further developed during the research project.

All subjects will be tested in the pre-phase and post-phase by two coders. This way I can measure the Inter-rater reliability**,** the degree of agreement among the coders. Both test instrument and observation list will be checked on content validity (does the measure represents all aspects the key concept kinaesthetic empathy?) [12]

5.7. Data analysis methods: ANOVA

The following statistical methods[13] are traditionally used in comparing groups with pretest and posttest data: (1) Analysis of variance (ANOVA) on the gain scores, (2) Analysis of covariance (ANCOVA), (3) ANOVA on residual scores, and (4) Repeated measures ANOVA. In all these methods, the use of pretest scores helps to reduce error variance, thus producing more powerful tests than designs with no pretest data (Dimitrov and Rumrill, 2003).

For this experimental study the ANOVA will serve well. ANOVA uses gain scores ($D = Y2 - Y1$). The ANOVA method has been criticized because of the assertion that the difference between scores is much less reliable than the scores themselves. However Dimitrov and Rumrill (2003) say that this is a traditional misconception: "In contrary to the traditional misconception, the reliability of gain scores is high in many practical situations, particularly when the pre- and posttest scores do not have equal variance and equal reliability" (p.164). .

6. Detailed workplan and planning of chapters

The written dissertation is divided into two parts. The first part provides the theory, the second part is dedicated to the experimental study.

The first part will consist of six chapters (as outlined in 4.2.), an introduction and a conclusion, where I will present my own integrated theory of kinesthetic empathy as a crucial tool for dance education for children with special needs. I have already undertaken a significant amount of research on the theory of mind, imitation theory and the concept of kinaesthetic empathy, and expect to produce provisional drafts of the theoretical parts of the first three chapters within the first year.

In the second year I will complete a provisional draft of the fourth, fifth and sixth chapters. In the second year I will also prepare the experimental study, develop the intensive dance therapy and work on the questionnaire and observation list.

The third year is completely dedicated to the experimental design. The intensive dance therapy will be developed in close collaboration with at least 3 students of the Fontys Dansacademie, specialised in dance therapy. A testing instrument will be developed together with an observation list. In the second half of the third year all children will be tested, the treatment group will receive dance therapy over a period of three months, after which all children will be tested again.

In the fourth year the statistical analysis will take place. I will draw conclusions and write the second part of my dissertation which consists of a description of:

- Method
- Hypothesis
- Operationalisation of key concepts
- Test-instrument and observation list
- Internal validity, external validity and reliability
- The experimental set-up

[12] Content validity: Does the instrument represent all aspects of the key concept kinaesthetic empathy?

[13] Notations used in this paragraph are: $Y1$ = pretest scores, T = experimental treatment, $Y2$ = posttest scores, $D = Y2 - Y1$ (gain scores), and RD = randomized design

- Data-analysis: anova
- Results and conclusions

During the whole research period, I will also actively seek publication of sections of my research as they develop, and identify and attend relevant conferences to present my material[14].

7. Qualifications of the Candidate

In 1987 I was a student at the Fontys Dance Academy, department expressionistic dance. I decided however to pursue an academic carrier and in 1994 I graduated cum laude at the Catholic University of Nijmegen, department of Orthopedagogy. My scriptie, under guidance of Prof. dr. De Bruyn, focussed on decision making processes in multidisciplinary teams. In the same period I obtained a propedeuse in the History of Art , also at the Catholic University of Nijmegen. From 1994-1998 I worked as a junior researcher and teacher at the same department. Next to my research into decision making processes, I teached various subjects amongst which, Method and Observation, Perception and Observation, Argumentation, Introduction into Pedagogy and others.
It was only in 1996 that I picked up dancing again. From 1998-2000, I was a guest student at the School for New Dance Development, Amsterdam. In 2002, I was selected for the prestigious masters program Dance Unlimited, a study into choreography from which I graduated in June 2004. As a performer I have been involved in several physical theatre companies amongst which Warner & Consorten between 1997-2002. I also presented own artistic work in several national and international festivals, like 'Internationales Solo-Tanz-Theater Festival', Stuttgart; Dance Screen, Monaco; Il coreografo Elletronico, Napels; Festival for Young Choreographers in Venezuela and others. Most recently (October 2003) I won the first price in the webdance competition organised by the NPS (Dutch Public Television Station).

In April 2003 I gave a lecture about Perception and Dance at the Rietveld Academy. A month later I gave a workshop Dance and Technology at the Hochschule fur Media in Köln together with Scott delaHunta.In September 2003 I did a presentation at the COSIGN conference on semiotics and computers, University of Teesside in England. The paper 'Trilogy' was accepted for The Online Journal for Embodied Technology, January 2004.). In October 2005 I gave a lecture at the NGE-symposium (Nederlands Genootschap voor Esthetica) and in January 2006 I published a paper about practice-based-research in Theater Topics. In 2009 I was senior editor of the first issue of RTRSRCH, journal of ARTI. 'Minor gestures and their monstrous little brothers': the spectatorship of the catastrophic.

From 2004-2009 I worked at the Lectoraat Art Theory and Research, as well as the Lectoraat Art Practice and Development, at the Amsterdam School of the Arts. My research, entitled '*Embodied experiences in dance: the way repetition and disappearance function in the construction of meaning',* was pracice based. The project aimed to rethink the relationship between choreography, representation and subjectivity, with a strong focus on developments within the field of new dance: specifically dances that initiate a critique of representation by the act of disappearance and repetition.

I regularly teach at the Amsterdam School of the Arts. Since may 2009 I am a 'dance advisor' at Kunstfactor.

[14] IGEL conference Utrecht, May 2020; conference on Kinesthetic Empathy: Concepts and Contexts, Manchester April 2010, daCi conference (Dance and the Child conference; CEP conference (Consciousness and Experiential Psychology conference) and others.

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