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Abstract: Interpersonal experiences have been focus of philosophy and developmental psychology for decades. Concepts of self and self-other relatedness seem to have an onset in early interaction patterns during dyadic relating. Phenomenologists consider the embodied, that is the intercorporeal, dialogue the base of self-other relating. Developmental psychologists have shown during many studies that the responsiveness a child is met with during early phases of life is a very subtle process. Kinetic intersubjectivity is introduced as a perspective on dyadic relating. Kinetic attitude during dance duets is taken as an example of active nonverbal attunement between movers. Shared movement situations will serve as a case to explain how a sense of intersubjectivity and self-other differentiation can be perceived and developed through movement structures. Shared movement intervention could offer a new perspective for psychotherapeutic intervention in disorders with a disturbed self, like in autism.

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## **Kinetic intersubjectivity:**

### **A dance informed contribution to self other relatedness and shared experience**

#### **Abstract:**

Interpersonal experiences have been focus of philosophy and developmental psychology for decades. Concepts of self and self-other relatedness seem to have an onset in early interaction patterns during dyadic relating. Phenomenologists consider the embodied, that is the intercorporeal, dialogue the base of self-other relating. Developmental psychologists have shown during many studies that the responsiveness a child is met with during early phases of life is a very subtle process. Kinetic intersubjectivity is introduced as a perspective on dyadic relating. Kinetic attitude during dance duets is taken as an example of active nonverbal attunement between movers. Shared movement situations will serve as a case to explain how a sense of intersubjectivity and self-other differentiation can be perceived and developed through movement structures. Shared movement intervention could offer a new perspective for psychotherapeutic intervention in disorders with a disturbed self, like in autism.

#### **Keywords**

Embodiment, kinetic intersubjectivity, dance, dance movement psychotherapy, shared movement, autism

#### **Introduction**

Intersubjectivity is bound to our embodied presence and self-other relatedness. Concepts taken from dance as a healing art, combined with concepts from phenomenology can contribute to a body-informed perspective on intersubjectivity that reaches into the roots of pre-conceptual interpersonal interaction in early development. This goes beyond models of cognitive strategies to capture self-other relations such as theory of mind (ToM) and simulation theory (ST).

Clinical experiences from dance movement psychotherapy (DMP) can add to our insights on embodied relationships and self-other relatedness. Partnering, as in dance duets, is taken as a model for mutual attunement and engagement in DMP. The duet partners form a non-verbally attuning dyad. As the dancers engage in the movement dialogue/encounter with each other, they experience a bodily anchored sense of self. In dancing together both dancers feel, through direct perception, the kinaesthetic qualities of their movement patterns. Regulation of

1 the duet is achieved by each adjusting their impulses to the dynamics of the interaction as  
2 perceived through non-conceptual kinaesthetic and proprioceptive sensations. The dancers  
3 come to experience themselves as an intentional subject, capable of affecting the shared non-  
4 verbal experience. Self-other distinction derives from differentiating the movement patterns  
5 between the dance partners, by doing so, personal variations of the previously shared dance  
6 and attunement patterns will occur.  
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11 We argue that the special case of DMP with patients with autism spectrum disorders (ASD)  
12 can deepen our understanding of how to address non-verbal attunement in embodied dyadic  
13 relations.  
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### 17 18 19 **Intersubjectivity** 20

21 Phenomenologists have used the term intersubjectivity in the course of investigating the  
22 nature of a subject's experiences of being in the world with others. At the core of this concept  
23 is the engagement of a subject or self in relation to others around him. There have been  
24 different positions among phenomenologists to describe the properties of this engagement,  
25 which could be taken as a two-sided phenomenon between the individual and the other.  
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31 Husserl (1952) takes a perspective from the individual being towards the world when he  
32 states that for me to experience myself in congruence with another person I would need to  
33 shape my own body according to the visual information I've got about the other's body.  
34 Doing so, my bodily experience informs me about the experience of the other. This  
35 presupposes the ability to match my visual impressions to my bodily positioning and the  
36 ability to conclude from my own bodily experiencing sameness or otherness in regard to the  
37 other.  
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44 By arguing that the experience of sameness between two interacting subjects would emerge  
45 from a shared intentionality towards a shared object, Merleau Ponty (1962) shifted the  
46 perspective from the individual being towards the world into the individual being in the world  
47 when. For a subject the experience of sameness with another person would come from  
48 sharing same intentional gestures towards the same object. In shared (social) actions towards  
49 an object the subjects would experience intercorporeality. This intercorporeality would not only  
50 be informed by the individual actions, but in the shared space the individual subject would be  
51 able to know the intentionality of the other through his gestures towards the shared object. It  
52 is from this special shared space that we develop mutual understanding that we are each  
53 separate and together at the same time.  
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2 Elaborating on these views, current phenomenological approaches describe intersubjectivity  
3 as embodied socially attuned actions between persons, indicating a view on social relating  
4 that no longer separates the brain from the body, but considers cerebral processes as being  
5 processes of tissue and flesh (De Preester, 2008). My body is the means to perceive the other  
6 as intentional subject, because it is capable of the same actions (De Preester, 2008).  
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11 Intersubjectivity was proposed to be an embodied practice (Gallagher, 2005). A bodily  
12 intentionality is shared by the perceiving subject and the perceived other through direct  
13 perception (Gallagher, 2008) In direct perception a proprioceptive component is matched to  
14 the perceptive component through sensitivity to bodily movements, gazes, facial expressions.  
15 In Gallagher's view intersubjectivity is a subject's notion of being in the perception of the  
16 other as the other is in his (Gallagher, 2005). He links phenomenology to neuroscience by  
17 referring to the function of a mirror neuron system as neuronal bridge between self and other  
18 that might be active in this process (Gallagher, 2008).  
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27 Gallagher and Hutto (2008) present primary intersubjectivity as pragmatic and body-related.  
28 They argue that primary intersubjectivity develops through direct perception without any  
29 mental representations needed. Later during childhood secondary intersubjectivity and theory  
30 of mind would develop from this basis. The body-related primary interaction leads toward  
31 experiences of shared intentionality that later in development form the basis for shared  
32 representations and shared narrative practices (Gallagher & Hutto, 2008).  
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39 In the enactive approach that has been presented by De Jaegher & Di Paolo (2008) the  
40 interaction process is focus of attention. Sense-making derives from responsive sensori-motor  
41 engagement with the environment. The shared 'in-between' in itself becomes the source of  
42 sensations, intentionality and meaning.  
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47 All these approaches clearly differ from those that focus on mental representations of the  
48 other during social experiences of a subject; which could be considered a more  
49 Cartesian/rationalistic approach towards intersubjectivity.  
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54 In the cognitivist perspective the mind as an information processing system makes up inner  
55 representations of the other/the world. The concrete linkage between subject and other is not  
56 taken into account; the cognitive performance is described as if solely an activity of the mind.  
57 From the perspective of ToM a subject needs to know what is going on in the other's mind in  
58 order to know about sameness of otherness. In a ST approach a subject would need to  
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1 reproduce feeling or imagination in order to know about what is going on in the other  
2 person's mind or feeling.  
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5 Both theories presuppose a clearly developed third person understanding of the individual.  
6 The development of this first – third person differentiation stays in the obscure. These  
7 abilities occur in later developmental phases and may be considered an outcome of  
8 maturation of mental functioning.  
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### 11 **Intersubjectivity through non-verbal exchange**

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18 The origins and development of first to second person relating has been a focus of  
19 developmental psychology since the 1960s, when developmental psychologists started to  
20 describe the early dyadic exchanges in terms of behaviour. Imaging techniques, like film and  
21 video were used to capture the evolving communication during the neonatal and infant phase  
22 (for example Bullowa, 1979, Beebe & Lachmann, 1988, Trevarthen, 1998, Kestenberg,  
23 1975). Interaction in the early dyad was considered a model of developing self-other  
24 distinction.  
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31 During extensive studies of pre-linguistic patterns of infant communication Bullowa (1979)  
32 found that attention towards a caregiver could be traced by following the child's orienting  
33 movement and gaze. According to Bullowa, for the caregiver to grasp the intention of the  
34 child, a 'change...produced by motion' must have taken place in the infant (1979, p. 23).  
35 With a continuous undifferentiated state one would feel no signal to connect with the child.  
36 She documented this motion-oriented perspective in series of photographs of mother-infant  
37 interactions.  
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44 This type of observation was carried on by Trevarthen (1998), who from these observations  
45 set a theoretical frame of reference for person-to-person interactions in infancy. In his concept  
46 of primary intersubjectivity he refers to interactions that unfold intersubjectivity through the  
47 attuned movement patterns between caregiver and child.  
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53 The term 'proto conversation' had been used earlier by Bateson (1979 p. 65) to describe the  
54 early dialogues between mother and child. The cyclic shifts of little rhythmic or melodic  
55 structures over time during proto conversations were understood to be precursors of language.  
56 Strikingly, for the interpretation of the early video-studies semantic structures were used to  
57 explain the early non-verbal attuning processes between mother and child.  
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3 From the primary interrelating the mother-child dyad develops towards secondary  
4 intersubjectivity (Trevarthen & Hubley, 1978). In the secondary intersubjective exchange the  
5 child is able to take the other into account as an intentional being. Co-operative interplay  
6 between child and caregiver, joint attention and other forms of person-person object  
7 awareness develop in this phase. They are understood to form the basis of ToM (Meltzoff &  
8 Gopnik, 1993).  
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15 Imitation was found to play a prominent role in the non-verbal dialogue in the early dyad. Meltzoff  
16 and Moore (1998) showed that new-borns are able to imitate facial expressions of adult  
17 communication partners a few hours after birth. It was proposed that the neonate was born with a  
18 cerebral representation of the other which enabled him not only to recognise species and animate  
19 interactive behaviour, but also to match a visually perceived facial expression with a motor imitation  
20 of that very impression (Meltzoff & Decety, 2003). From these findings the question rose which  
21 inner processes of the child could constitute the ability to react sensitive to members of their specie.  
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Neuroscientists hypothesized on precursors of self that are rooted in the bodily experience of the baby being simultaneously acting and perceiving. Early imitation might arise from a ‘proto-self’ in sensory and motor domains (Panksepp, 1998). Rochat (1998) showed that three-month-old infants reacted sensitive to self-produced movements of legs and suggested an early body inherent organization. This body schema might be present from birth, shaped by multimodal experience gained through self-observation while experiencing (self) movement. Through the self-observing activity the child is shaping a sense of body as object to perception of the self. This self-objectification might be considered a precursor of self-reflection (Rochat, 2002) that enables the child to make a self-other distinction.

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However, during imitation there is an on-going process of mutual influence. Both child and adult are oriented towards the other with a strong sensitivity towards minimal shifts in the corporeal patterns. The adult is answering the child from their empathetic resonance. This double sidedness of the intersubjective exchange is taken into account by Fuchs and De Jaegher (2009), when they describe the reciprocal involvement during intersubjective experiences as mutual incorporation, “in which each lived body reaches out to embody the other” (ibid, p. 474). They account for an enactive approach to intersubjectivity wherein social understanding is generated through intercorporeal participation in shared dynamical whole-body actions. It is from interaction in this embodied responsiveness that intentions and meanings can be generated.



## **The early dyad: a body-informed perspective**

As we have seen many models on intersubjectivity take a first-second person perspective. However, from a developmental point of view, we have to consider that the neonate comes from prenatal state with the experience of being at one with the organism of the mother. We therefore make the assumption that the primary task in the neurotypical development is not to develop sameness, but to develop otherness. Indeed, sameness has been the (embodied) experience up to birth. The neonate comes into the world with shared experiences of diverse quality. Foremost the most elementary rhythms like breath and heartbeat have been shared with mother, as have the hormonal shifts, the shifts of activation coming from day-night rhythms, mood swings and so on. Perceptions from the surroundings like sounds, light and touch have come to the embryo. We know that unborn babies react to light and sounds and that children who have listened to specific music during pregnancy may show a preference for that music later on in life. We also know from antenatal care that the touch of mother or father, perceived through the skin of the mother, makes the baby “shift into the hand” of the touching person. Here clearly a kinaesthetic perception plays a role in the organism-to-organism communication. These proprioceptive experiences might of course feel different from either side of the shared boundary, but they form most elementary act (ion) s of relating. Through the shared proprioceptive experiences the child and the parent are after birth kinaesthetically equipped to regulate the dyadic contact between them. The challenge for the baby then is to develop and recognise otherness without losing the sense of connectedness.

In this early attunement there is not just one (correct) way of relating or responding to the impulses of the child. What is to be a successful matching (and from time to time clashing) dyad (and triad) would depend on the specific strengths and needs of the interacting partners.

In early dyads it is crucial that the child feels well organised by the adult and that the adult feels capable of organising the child. This organisation is achieved through direct perception through the kinaesthetic senses, with the establishment of weight and body containment as the most elementary features at hand.

These elementary shared kinaesthetics can be described as “kinetic intersubjectivity”. Proprioceptive experiences from early non-verbal attunement in the dyad form a template for bodily and social engagement later on in life. Non-verbal attunement patterns underlie all

1 social interactions. We are very sensitive to these processes without always being aware of it.  
2 A direct 'felt sense' (Gendlin, 1962/1997) provides us with feelings of matching or clashing  
3 interaction partners, whether we want closeness or distance, whether we feel 'at ease' or 'out  
4 of sync' - our language covers these processes through expressions like 'in touch' or 'the  
5 chemistry between us was right', indicating the subtle under-streams in non-verbal  
6 communication.  
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11 The character of non-verbal social orientation undergoes significant changes throughout life,  
12 and the attunement patterns in healthy subjects will fluctuate with, and are very sensitive to,  
13 the social structure of a situation. It develops from shared kinaesthetic qualities towards  
14 shared narratives. In narrative practice the experiences from kinaesthetic attunement still  
15 guide the quality and character of shared narratives.  
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21 From a neurobiological point of view this perspective has been enlightened by Hurley (2006).  
22 Although originally coming from the perspective of simulation theory she presented a model  
23 on the role of shared (neuronal) circuits in the process of differentiation from neonate  
24 symbiotic state towards self-other differentiation. According to Hurley this would require five  
25 developmental steps, with the first to be 'basic adaptive feedback control' that enables the  
26 interacting subjects to participate in each other's actions without mental representations.  
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33 In psychopathology we find disturbances of the mutual attunement between caregiver and  
34 child. These can rise from not being matched well or they can originate from innate or  
35 developmental pathology. How psychopathology in caregivers can influence the dyadic  
36 attunement has been illustrated by the impressive vignettes of babies of depressed mothers that  
37 show bodily disorganisation and disruptions and disengage from contact with the depressed  
38 caregiver by not looking at or towards her (Papousek & Papousek, 1997). The impact of  
39 developmental disorders on the dyadic exchange has been illustrated by studies that  
40 investigated interactional responses of neurotypical partners during interviews with  
41 adolescents with ASD. Studies on gestural interpersonal engagement during interviews with  
42 adolescents with ASD showed appropriate use of gestures, but the feeling of intersubjective  
43 exchange in the communication partner differed significantly between the groups of typical  
44 and ASD adolescents (Garcia-Perez, Lee & Hobson, 2007).  
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53 Both examples show that the dyadic partnering is a flexible process of adjustments. Non-  
54 verbal attunement and differentiation is a learning process that works in both directions: the  
55 child and the caregiver.  
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## Explorations into intersubjectivity: a dance-informed approach

(Aesthetics of intersubjectivity)

Structures from dance as an art form can help us to understand the earliest forms of intersubjectivity that have been described above. For example, improvised dance duets are embodied participation in shared kinaesthetic patterns. In dance duets mutual understanding and shared creation of relationship arise from kinaesthetic partnering. Regulation of the duet is achieved by adjusting one's own impulses and adapting these to the dynamics of the interaction. During kinaesthetic partnering dancers are engaged in highly attuned mutual responsiveness. In this process shared kinetic qualities present an 'in-between' experience. In the 'in-betweenness' the dancers experience each other through the shared movement qualities.

Participating in each other's movement patterns both dancers feel, through direct perception, the kinetic qualities of their own movement patterns and those of their partner (Fuchs & Gambling, 2009). This self-related and at the same time empathetic relatedness happens through the non-conceptual kinaesthetic and proprioceptive sensations coming from the dancer's own body as well as from the partner's body. While attuning to a partner and feeling the other person's movements it is possible for a dancer to feel at the same time his own movements through proprioception. While dancing "a tactile-kinaesthetic body" is "dynamically attuned" to the world (Sheets-Johnstone, 1999, p. 261).

From the shared kinetic qualities a sense of intersubjectivity develops that is not informed by conceptual or representational systems. It is enlivened by the directly perceived immediacy of shared movement qualities between dancers. The kinaesthetic engagement in non-conceptual shared space, time and weight allows direct movement reactions. This primal responsiveness has been described as tensional dialogue, 'dialogue tonique' by De Ajuriaguerra and Angelergues (1962 p. 21, as quoted by Corraze, 1997) in their psycho-motor view on the early interaction patterns between child and caregiver.

A dancer can experience intentionality and agency by differentiating from the shared movement quality into personal/individual movement patterns. The sense of agency during kinaesthetic partnering is directly perceived and transmitted by a "felt sense" as described by Gendlin (1962/1997, p. 67). Kinaesthetic attitude and neuronal processes enable dancers to empathetically attune to their dance partner during duet improvisation. Findings from neuroscience suggest that mirror neurons play a significant role in these processes (Rizzolatti et. al, 2009; Berrol, 2006).

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3 **The Social brain: modulation by experience**

4 The brain is a developing organ (Schore, 1998). The brain organisation is shaped by  
5 experiences and vice versa. Plasticity and connectivity of neural circuits are the result of close  
6 interaction of biological maturation of matter and experiential shaping of matter (Keysers &  
7 Gazzola, 2006). The structure of our brain organisation forms experiences (Schore, 2003; van  
8 der Kolk, 2003).  
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14 As experiencing is bound to the embodied self (Rochat, 2002), the social templates of  
15 brain/neuronal structure are the result of embodied relational experiences (Jonsen et al, 2002).  
16 We might therefore expect that the neuronal wiring of the brain will develop new pathways for  
17 action recognition and social relatedness by embodied experiences that combine perceptive  
18 and proprioceptive sensory input. Therefore in cases of disturbed early intersubjectivity,  
19 compensational intervention should support embodied relational engagement and provide  
20 intersubjective experience (see for the same concept “Nachsozialisation” Petzold, 1988,  
21 p.236).  
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30 Dance situations address the specific functionality captured by the mirror neuron system  
31 (MNS) and shared neuronal circuits. The interplay of sensori-motor components during  
32 kinaesthetic partnering is characterised by the sensory simultaneity of feeling my body while  
33 seeing my movement, or hearing the sounds of my movement. This simultaneous presence of  
34 sensations coming from within the body and that coming from outside the body is neurological  
35 covered by mirror neuron activity (Bråten, 2007). Observed action is matched to self-  
36 performed action. Keysers and Perret (2004) suggested that the neuronal networks are shaped  
37 by simultaneous co-operating groups of neurons. Through Hebbian learning cells that fire  
38 simultaneously would then build shared neuronal circuits.  
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46 In studies with dancers the observation of expressive movements led to MNS activity. The  
47 expert dancers showed stronger brain activation when watching a movement style they were  
48 trained in (Calvo-Merino et al 2005). During the observation of dancers, proprioception is  
49 activated more while watching familiar movements. Personal movement experience  
50 contributes to plasticity in the involved neuronal circuits (Calvo-Merino et al, 2006). This  
51 might lead towards the hypothesis that MNS could be looked upon as an inherited potential of  
52 the human brain that can develop throughout life by experience.  
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1 It should be taken into account then that social emotional development is not only defined in  
2 terms of behaviour but also in terms of a maturing and developing social brain (Sommerville  
3 & Decety, 2006). Indeed, researchers have shown that the brain develops throughout  
4 childhood and that adolescence is a sensitive phase for the social brain, as in this phase brain  
5 matter and organisation go through a major shift (Blakemore et al 2007; Crone, 2009).  
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9 The proprioceptive and perceptive experiences of kinaesthetic partnering contribute to body  
10 memory. Characteristic kinetic properties define in neural traces the memory of shared  
11 movement qualities. During kinaesthetic partnering the perceptive traces are not limited to the  
12 subject's body and movements, but they also include memories of the moving partner. Thus a  
13 memory, or to use Stern's words, "representation interaction that has been generalised" (Stern  
14 1985/2006, p. 112), "being with" (ibid., p. 111) and "feeling felt" (Siegel 1996, p. 149) is  
15 generated to the subject's implicit patterns of being with others.  
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### 22 **Kinaesthetic/body-informed intersubjectivity in dance movement psychotherapy**

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24 Dance movement psychotherapy (DMP) actively addresses the body-informed  
25 intersubjectivity we have described above. The therapeutic relationship is achieved through  
26 movement and dance (Payne, 2009). The therapist will route the therapeutic relationship into  
27 kinetic intersubjectivity by using shared movement as a specific intervention. In the shared  
28 movement situation the therapist uses her own bodily movement to 'join' (Payne 1992, p. 63)  
29 with the movement patterns of the patient. In this corporeal relationship the therapist initially  
30 connects with the patient's movement patterns, mirroring them with highly attuned movement  
31 patterns. In cases of pathological self-organisation or self-regulation the patient may not be  
32 able to initiate engagement in a mutual relationship. During the one-sided intentionality from  
33 the therapist towards the patient, the aim is to bring about bodily-based change in intention  
34 and attention. The patient is offered a visual and acoustic impression of her/his personal  
35 movement material through the attuned movement intervention of the therapist, whilst at the  
36 same time s/he is experiencing her/his own movements through the kinaesthetic senses. The  
37 therapist may support the patient's kinaesthetic, direct perception of the dance partner through  
38 changes in the kinetic qualities such as a shift of rhythm or movement direction, change of  
39 spatial position or use of weight (Samaritter, 2009). Participating in the kinaesthetic  
40 partnering the patient is capable of affecting and regulating the shared kinetic qualities  
41 through the movement s/he contributes to the duet. This activity is similar to the awareness  
42 that dancers use to address and attune their movements towards a partner in dance  
43 improvisation as an art form in duets and group performances (Tufnell & Crickmay, 2004;  
44 Fuchs & Gambling, 2009). A 180-degree turn for example would change the relation between  
45 the two dancers substantially. Through his/her movement actions the patient, as a duet  
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1 partner, comes to experience him-/herself as an intentional subject that is met by the  
2 responsive attitude of the therapist. From shared movement qualities the movers develop  
3 towards a relational mode that is still characterised by intentional attunement to each other,  
4 and through interplay or counterbalancing of movement patterns a quality of dialogue is  
5 achieved. Through this non-verbal relating in kinetic qualities during the therapeutic dyadic  
6 relations connects with preverbal structures of interaction that we have described as kinetic  
7 intersubjectivity (Samaritter, 2010). The experience of kinetic structures of mutual  
8 responsiveness contributes to embodied memory. According to a Hebbian perspective we  
9 would expect that these experiences also shape then the neuronal structures involved (Keysers  
10 et al., 2010; Calvo-Merino et al., 2006).

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18 Dance movement psychotherapists use movement diagnostic inventories to analyse movement  
19 patterns of patient and capture movement profiles. There are diagnostic instruments usually based on  
20 Laban Movement Analysis (Laban, 1980; Bartenieff & Lewis, 1980/2002), a system that allows  
21 capturing body and spatial organisation as well as combined kinetic qualities from the aspects space,  
22 time, weight and movement flow (Koch & Bender, 2007).

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28 In addition to the personal movement profile dance movement psychotherapists use movement  
29 analysis to profile the patient's movement in relation to the therapist, group-members or partner as  
30 expressed in shape flow patterns and tension flow rhythms (Kestenberg-Amighi, Loman, Lewis &  
31 Sossin, 1999).

### 32 33 34 35 36 **Kinetic intersubjectivity: the special case of autism**

37  
38 Psychopathology may severely interfere with the development of mutual engagement. Reciprocal  
39 responsiveness may not emerge spontaneously during development. The responsive attunement to  
40 an interaction partner is a delicate equilibrium that can be easily influenced by mood and anxiety, or  
41 even severely disturbed as in communicative and developmental disorders or psychotic traits.  
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46 Atypical social engagement in autism has shown to have an impact on these person-to-person  
47 relations from early developmental stage (Rogers & Williams, 2006). It has been observed  
48 that children with ASD show:

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51 - diminished interpersonal exchange (like eye-contact, imitation of simple body movements,  
52 as well as symbolic imitation)  
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54 - diminished attention to environment (synchronising, pointing, joint attention,).  
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58 Of all the dimensions in the appearance of autistic traits the lack of social orientation and relating is  
59 probably the most significant. It is a core marker through all the diverse phenotypes (Kanner, 1943;  
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APA, 2000; WHO, 1992). For a long time theoretical models tried to explain impaired social development in ASD through orienting on the deficits in the development of social cognition. A strong accent had been given to theories that focus on the development of mental procedures that allow the child to ascribe mental processes to others and learn to predict other peoples' behaviour. Mental representations of others like in ToM that enable the acting subject to take into account other subject's interests, states, thoughts, feelings, has been shown to be weak in autistic individuals during behavioural and mentalizing tasks (Baron-Cohen, Leslie & Frith, 1985; Gallagher et al, 2000; Baron-Cohen 2003).

Other mainstream theories on the development of social cognition hold that in ASD the lack of mental representation stems from atypical resonance or mental simulation. The ASD child comes to the world with innate atypical resonance to the attuning environment. The atypical attunement patterns that occur then in the dyadic dialogue do not allow mental simulation to emerge (Gallese, 2007; Williams, 2008).

From the atypical biological structures in early relations in ASD a gap, or retardation, in the emerging intersubjectivity will develop due to the lack of (relational) experience and from that atypical "ways of being with" (Stern, 1985/2006, p. XV) will emerge. Indeed a few research studies have shown that the interactive behaviour of caregivers of children with ASD alters with a tendency towards flattening. In studies on home-videos early atypical attuning patterns between children with ASD and their caregivers have been found (Wimpory et al., 2000).

Clinical observations had shown that children with ASD less frequently imitate interaction partners than typically developing children. Rogers and Pennington (1991) put forward the theory that autism might be rooted in impaired early imitation. This could result then in further social-communicative impairments in later developmental phases, and thus affect the ability to mirror and share emotions and to empathetically engage with another subject. Studies on imitation have shown that children with ASD performed as well as typically developing children in tasks with complex goal-directed actions, but were significantly different in their imitation of the style in which the actions were performed. Also spontaneous imitation was significantly less present in children with ASD than typically developing children (Rogers et al, 1996; Rogers, Hepburn Stackhouse & Wehner, 2003; Rogers & Williams 2006; Hobson & Hobson 2008).

Self-regulation by the child with ASD consequently is not achieved by directing movements towards another person in the environment, but by directing movements towards itself. Thus the child is creating a circular perception of its own body. Most vividly this is to be observed in the repetitive movements in nearby space, like rocking, spinning, flapping, flicking and fast hand movements close

1 to the eyes etc. Rochat (1998) had shown that early body organisation and body image arise in  
2 typical developing children from the repetitive self-observation. The repetitive stimulation of  
3 kinaesthetic senses and visual self-perception in ASD might be understood as an attempt to establish  
4 a notion/feeling of the boundaries of the body and to generate a feeling of sameness.  
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8 This bodily anchored sense of self would then not be an interpersonal one as in typical development  
9 (Stern, 1985/2006) but a solipsistic one. Hobson (1990) suggested that the development of an  
10 interpersonal self might be impaired in autism. He points out that children with ASD do not develop  
11 a concept of self matching the separated other, as they “fail to be aware of themselves in the minds  
12 of others” and “fail to understand the nature of other persons who have their own psychological  
13 orientation toward the world” (ibid., p. 174).  
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20 In the research studies on spontaneous gestures of social engagement autistic children and  
21 adolescents were offering less spontaneous verbal and non-verbal gestures of greeting and farewell.  
22 Autistic subjects responded less often with eye contact when offered a greeting and fewer children  
23 smiled when waved good-bye (Hobson & Lee, 1998). Studies on gestural interpersonal engagement  
24 during interviews with adolescents with ASD showed appropriate use of gestures, but the feeling of  
25 intersubjective exchange in the communication partner differed significantly between the groups of  
26 typical and ASD adolescents (Garcia-Perez, Lee & Hobson, 2007). In earlier studies, Dawson and  
27 Galpert (1990) showed that social orienting behaviour in children with ASD increased after their  
28 mothers had imitated them during play situations.  
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37 Field, Sanders and Nadel (2001) showed that imitation by an adult changed non-verbal engaging  
38 behaviour in children with ASD. Of six rated items of non-verbal engaging behaviour (looking at  
39 person, positive facial expressions, negative facial expressions, positive social gestures, close  
40 proximity and touching) five items occurred more often after imitation of the child by an adult.  
41 Escalona et al (2001) found in a similar study that the children after imitation spent less time in  
42 gross-motor movements and showed increased frequency of physical contact behaviour (spatial  
43 closeness, touch). These results suggest that imitation by an adult might offer a useful potential in the  
44 early intervention of children with ASD to support the development of social engagement.  
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52 Programmes for early intervention picked up on these studies. Rogers et al (2003) showed that early  
53 imitative intervention changed the frequency of initiating contact by the autistic child. Early  
54 intervention programme at the MIND institute gave positive results concerning social engaging  
55 behaviour of the autistic child (Carpenter, Pennington & Rogers, 2001).  
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60 Ingersoll, Lewis and Kroman (2007) showed that teaching imitation and spontaneous use of  
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descriptive gestures to young children with ASD increases their imitation of gestures in structured settings; also some participants used more spontaneous descriptive gestures. These studies focussed on gestural imitation, which is a form of conceptual interaction. However valuable they are in the course of early intervention, they do not solve the problem of primary relating with the child with ASD.

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From the perspective of kinetic intersubjectivity we find that the semantic structures, that have shown to change after diverse interventions based on imitation do not necessarily have an impact on the nonverbal attunement behaviour that as we have seen underlies all (pro-) social behaviour.

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In terms of body organisation the process of direct interaction in autism is hindered by the problems in the sensory motor organisation of the autistic child (Baranek, 2002). The development of primary intersubjectivity and subsequently secondary intersubjectivity would then be influenced by the atypical autistic perceptual organisation with a poor development of theory of mind as a result (Gallagher, 2004).

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The models of direct interaction (Gallagher, 2008) and enactive intersubjectivity (Fuchs & De Jaegher, 2009) offer the theoretical frame of reference for the study of the non-verbal relating of the autistic child with others through primary embodied exchange as it takes place in the dance movement therapeutic setting.

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Movement analysis during dyadic activity provides the opportunity to look at even earlier structures of interpersonal responsiveness that precede the semantic and conceptual structures. A micro-analysis of what is going on in the dyadic contact would be needed to analyse where intentionality of an attuning partner is met or answered by the patient. As discussed before, movement analysis instruments allow profiling the non-verbal characteristics of the dyadic attunement. Although every child and every dyad has specific characteristics of its own, there are strong similarities in movement patterns throughout the autistic spectrum. Sossin and Loman (1992) described that a general movement profile of ASD would be characterised by a tendency to use neutral shape-flow, which gives the impression of lack of (kinaesthetic) animation and involves loss of body boundaries. There is also characteristically a strong tendency to move with highly localised tension-flow, resulting in lack of movement continuity and in apparently unrelated or clashing patterns during movement adjustments. Partial stabilisation seems to be largely undeveloped together with a strong preference for shrinking patterns of shape flow. Shaping in spatial planes, like organising posture around a partner, is usually not found in ASD (Sossin & Loman, 1992).

1 Laban Movement Analysis (Laban, 1980) allows the notation of movement elements as they  
2 appear during the (non-verbal) interaction. This type of registration of non-verbal events as  
3 markers of (non-verbal) social behaviour has shown to be instrumental for observations during  
4 research projects as well as therapies (Loman & Foley, 2003; Koch & Müller, 2007; Lotan &  
5 Tziperman, 1995; 2005).  
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10 Using micro kinetic analysis, the dance movement therapist will organise the movement situation to  
11 join in the patterns of the patient. Close attunement to movement patterns have shown to bring about  
12 spontaneous movement responses (Loman, 1995; Erfer, 1995).  
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16 Attention is directed towards the patient's kinaesthetic perception. In the therapeutic situation non-  
17 verbal synchronisation and inter-corporeal relating are major techniques for establishing and  
18 maintaining contact and relationship. The therapist is mirroring, matching & challenging the child's  
19 movement through kinetic qualities like rhythm, weight and direction. The spontaneous movement  
20 reactions of the patient are met with embodied and moving responsiveness by the therapist. The  
21 shared dance situation offers the potential to reconnect with an autonomous creative and  
22 developmental process (Samaritter, 1990). Kinaesthetic partnering in non-conceptual kinetic forms  
23 of relatedness leads towards body-informed intersubjectivity. The patient experiences her/himself as  
24 an animated, acting subject capable of co-regulating the intersubjective relationship. Kinaesthetic  
25 experiences are wired through direct perception into the patient's organisation of the perceptual and  
26 proprioceptive body. The customary movement patterns thus are brought into a new relational  
27 context. These bodily-enlivened participatory experiences offer new 'ways of being with' and  
28 contribute to new body memory on interpersonal movement repertoire.  
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### 41 **Concluding remarks**

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43 In this paper we proposed a kinetic perspective to intersubjectivity. "Shared movement" has  
44 been presented as an approach for supporting social engagement in those with ASD. A model  
45 of kinaesthetic partnering has been introduced to describe mutual attunement and  
46 understanding during early dyadic interaction. Body-informed intersubjectivity emerges from  
47 attentive, kinaesthetic orientation towards a shared "in-between", that can be a gesture,  
48 movement quality or shared movement theme. In the co-creation of interpersonal relatedness  
49 the dancers come to experience themselves as intentional subjects through their impact on  
50 patterns and movement qualities of the shared movement. The moving body, that is, the  
51 acting and perceiving body, generates experiences of shared kinetic qualities through shared  
52 space, rhythm or weight. Differentiation from shared corporeality can lead towards the  
53 experience of agency and bodily anchored self.  
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