

Submission to Arts in Psychotherapy

Title:

Kinaesthetic Intersubjectivity:

A dance informed contribution to self-other relatedness and shared experience in non-verbal psychotherapy with an example from Autism

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Highlights:

- We describe a dance informed approach to psychotherapy
- Concepts from dance and developmental psychology serve to model a theoretical background for DMP
- We describe embodied and enactive interventions as fundamental in the in the therapeutic relationship.
- The “shared movement approach” is presented as intervention in Autism
- Positive outcome of this intervention has been reported in the clinical setting.

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Abstract:

Early interpersonal experiences have been the 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 as the basis for self-other relating. Developmental psychologists have shown that the responsiveness a child is met with during early phases of life is a very subtle process. Kinaesthetic intersubjectivity is introduced as a perspective on dyadic relating. Embodied attitude during dance duets is taken as an example of active nonverbal attunement between interaction partners. Shared movement situations will serve as an example of how a sense of intersubjectivity and self-other differentiation can be perceived through movement structures. Shared movement intervention could offer a new perspective for psychotherapeutic intervention in disorders with a disturbed self, like autism and need researching.

Keywords

Embodiment, kinaesthetic 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 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).

Partnering, as seen in improvised 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 the duet is achieved by each adjusting their impulses to the dynamics of the interaction as perceived through non-conceptual kinaesthetic and proprioceptive sensations. The dancers come to experience themselves as an intentional subject, capable of affecting the shared non-verbal experience. Self-other distinction derives from differentiating the movement patterns between the dance partners, by doing so personal variations of the previously shared dance and attunement patterns will occur.

Clinical experiences from dance movement psychotherapy (DMP) show strong similarities with embodied relationships and self-other relatedness as known from dance. We argue that the special case of DMP with patients with autism spectrum disorders (ASD) can deepen our understanding of how to address the difficulties these patients have with non-verbal attunement in dyadic relations, and how to support them through embodied psychotherapeutic intervention.

Intersubjectivity

Phenomenologists have used the term intersubjectivity in the course of investigating the nature of a subject's experiences of being in the world with others. At the core of this concept is the engagement of a subject or self in relation to others around him.

There have been different positions among phenomenologists to describe the

properties of this engagement, which could be taken as a two-sided phenomenon between the individual and the other.

The individual's orientation *towards* the world is the perspective Husserl (1952) takes when he states that for me to experience myself in congruence with another person I would need to shape my own body according to the visual information I have about the other's body. Doing so, my bodily experience informs me about the experience of the other. This presupposes the ability to match my visual impressions to my bodily positioning and the ability to conclude from my own bodily experiencing sameness or otherness in regard to the other.

Merleau Ponty (1962) shifted the perspective towards the individual being *in* the world when arguing that the experience of sameness between two interacting subjects would emerge from a shared intentionality towards a shared object. For a subject the experience of sameness with another person would come from sharing same intentional gestures towards the same object. In shared (social) actions towards an object the subjects would experience intercorporality. This would not only be informed by the individual actions, but in the shared space the individual subject would be able to know the intentionality of the other through his gestures towards the shared object. It is from this special shared space that we develop mutual understanding that we are each separate and together at the same time.

Elaborating on these views, current phenomenological approaches describe intersubjectivity as embodied, socially attuned actions between persons, indicating a view on social relating that no longer separates the brain from the body, but considers cerebral processes as being processes of tissue and flesh (De Preester, 2008). That is to say my body is the means to perceive the other as intentional subject, because it is capable of the same actions (ibid 2008).

Intersubjectivity is proposed to be an embodied practice by Gallagher (2005). A bodily intentionality is shared by the perceiving subject and the perceived other through direct perception (Gallagher, 2008). Here a proprioceptive component is matched to the perceptive component through sensitivity to bodily movements, gazes, facial expressions. In Gallagher's view intersubjectivity is the notion of me being in the perception of the other just as the other is in mine (Gallagher, 2005). He links phenomenology to neuroscience by referring to the function of a mirror neuron system as neuronal bridge between self and other that might be active in this process (Gallagher, 2008).

Primary intersubjectivity has been proposed to be pragmatic and body-related by Gallagher and Hutto (2008). They argue that primary intersubjectivity develops through direct perception without any mental representations needed. Later during childhood secondary intersubjectivity and theory of mind would develop from this basis. The body-related primary interaction leads toward experiences of shared intentionality that later in development form the basis for shared representations and narrative practices.

In the enactive approach that has been presented by De Jaegher and Di Paolo (2008) the interaction process is the focus of attention. Sense-making derives from responsive sensori-motor engagement with the environment. The shared 'in-between' space itself becomes the source of sensations, intentionality and meaning.

All these approaches clearly differ from those that focus on mental representations of the other during social experiences of a subject; which could be considered a more Cartesian/rationalistic approach towards intersubjectivity.

In the cognitivist perspective the mind as an information processing system makes up inner representations of the other/the world. The embodied connection between

subject and other is not taken into account; the cognitive performance is described as if solely an activity of the mind. From the perspective of ToM a subject needs to know what is going on in the other's mind in order to know about sameness of otherness. In a simulation theory (ST) approach a subject would need to reproduce feeling or imagination in order to know about what is going on in the other person's mind or what they are feeling.

Both theories presuppose a clearly developed third person understanding of the individual. The development of this first – third person differentiation occurs in later developmental phases and may be considered an outcome of a maturation of mental functioning. We argue that there is another, third way for the self to know about the other's mind and feeling state, that is, through embodied, kinaesthetic experiences.

Early infancy: intersubjectivity through non-verbal exchange

The infant's relating to others has been a focus of developmental psychology since the 1960s, when developmental psychologists started to describe the early dyadic exchanges in terms of behaviour. Imaging techniques, like film and video were used to capture the evolving communication of the neonatal and infant phase (for example Kestenberg, 1975; Bullowa, 1979; Beebe & Lachmann, 1988; Trevarthen, 1998).

Interaction in the early dyad was considered a model of developing self-other distinction.

During extensive studies of pre-linguistic patterns of infant communication Bullowa (1979) found that attention towards a caregiver could be traced by following the child's orienting movement and gaze. To grasp the intention of the child a change in motion must have taken place in the infant. With a continuous undifferentiated state one would feel no signal to connect with the child. She documented this motion-oriented perspective in series of photographs of mother-infant interactions.

Trevarthen (1998) continued this type of observation. He set a theoretical frame of reference for person-to-person interactions in infancy. In his concept of primary intersubjectivity he refers to interactions that unfold intersubjectivity through the attuned movement patterns between caregiver and child.

The term 'proto conversation' had been used earlier by Bateson (1979 p. 63/77) to describe the early dialogues between mother and child. The cyclic shifts of little rhythmic or melodic structures over time during proto conversations were understood to be precursors of language. For the interpretation of the early video-studies semantic structures were used to explain the early non-verbal attuning processes between mother and child.

From the primary interrelating the mother-child dyad develops towards secondary intersubjectivity (Trevarthen & Hubley, 1978). In the secondary intersubjective exchange the child is able to take the other into account as an intentional being. Co-operative interplay between child and caregiver, joint attention and other forms of person-person object awareness develop in this phase. They are understood to form the basis of ToM (Meltzoff & Gopnik, 1993).

Imitation was found to play a prominent role in the non-verbal dialogue in the early dyad. Meltzoff and Moore (1998) showed that new-borns are able to imitate facial expressions of adult communication partners a few hours after birth. It was proposed that the neonate was born with a cerebral representation of the other which enabled him not only to recognise species and animate interactive behaviour, but also to match a visually perceived facial expression with a motor imitation of that very impression (Meltzoff & Decety, 2003).

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.

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 neuro-typical 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 (Stuart, 2011). 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 such as sounds, light and touch have come to the embryo. We know that unborn babies react to light and sounds, and 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 (Loman, 2007). 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. After birth the shared proprioceptive experiences the child (and the parent) is (are) 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 (Kestenberg, Marcus, Robbins, Berlowe, & Buelte, 1971; Totoro, 2010)).

These elementary shared embodied experiences can be described as “kinaesthetic intersubjectivity”. Proprioceptive experiences from early non-verbal attunement in the

dyad form a template for bodily and social engagement later on in life and will continue to underlie all social interactions throughout life. We are very sensitive to these processes without always being aware of it. A direct 'felt sense' (Gendlin, 1962/1997) provides us with feelings of matching or clashing with interaction partners, whether we want closeness or distance, whether we feel 'at ease' or 'out of sync' - our language covers these processes through expressions like 'in touch', 'in tune' or 'the chemistry between us was right', indicating the subtle under-streams in non-verbal communication.

The character of non-verbal social orientation undergoes significant changes throughout life, and the attunement patterns in healthy subjects will fluctuate with, and are very sensitive to, the social structure of a situation. It develops from shared kinaesthetic qualities towards shared narratives. In narrative practice the experiences from kinaesthetic attunement still guide the quality and character of shared narratives (Gallagher & Hutto, 2008).

A neurobiological perspective on self-other differentiation has been proposed by Hurley (2006). Taking simulation theory into account she presented a model on the role of shared (neuronal) circuits in the process of differentiation from neonate symbiotic state towards self-other differentiation. According to Hurley this would require five developmental steps, with the first to be 'basic adaptive feedback control' that enables the interacting subjects to participate in each other's actions without mental representations.

In psychopathology we find disturbances of the mutual attunement between caregiver and child. These can arise from not being matched well or they can originate from innate or developmental pathology. How psychopathology in caregivers can influence the dyadic attunement has been illustrated by the impressive vignettes of

babies of depressed mothers that show bodily disorganisation and disruptions and disengage from contact with the depressed caregiver by not looking at or towards her (Papousek & Papousek, 1997). The impact of developmental disorders on the dyadic exchange has been illustrated by studies that investigated interactional responses of neurotypical partners during interviews with adolescents with ASD. These studies showed appropriate use of gestures, but the feeling of intersubjective exchange in the communication partner differed significantly between the groups of typical and ASD adolescents (Garcia-Perez, Lee & Hobson, 2007).

Both examples show that the dyadic partnering is a flexible process of adjustments. Non-verbal attunement is a mutual, interdependent, learning process that works in both directions: the child and the caregiver.

Explorations into intersubjectivity: a dance informed approach

The kinaesthetic perspective of the development of early interaction patterns show strong similarities with the structure of (adult) interrelating that we find in certain dance forms such as dance improvisation, specifically contact improvisation (Paxton, 2003) can help us to understand the earliest forms of intersubjectivity that have been described above. Improvised dance duets are embodied participation in shared kinaesthetic patterns. In dance duets mutual understanding and shared creation of relationship arise from kinaesthetic partnering (Banes, 1977/79). 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.

“...At several moments, both the dancers and the audience appear to be “taken by surprise” as one movement leads unexpected into another positioning and/or movement. I see the dancers awakening, coming together, struggling

over different personal and collective obstacles, experiencing moments of calm, moments of great elation, moving toward places where they are in tight synchronicity. At other times, they appear to be feeling each other out for possible new ways to be joined together for their individual and collective benefit...” (Gibbs, 2003, p.185)

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). Although cultural components might add a specific connotation to the perception of movement (Caldwell, 2010) a non-conceptual perspective would understand the empathetic relatedness that rises from the interaction between the two movers according to the kinaesthetic and proprioceptive sensations coming from the dancer's own body as well as from the partner's body (Pallant, 2006). 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 (Gibbs, 2003). While dancing “a tactile-kinaesthetic body” is “dynamically attuned” to the world (Sheets-Johnstone, 1999, p. 261).

It is enlivened by the directly perceived immediacy of shared movement qualities between dancers (Rouhiainen, 2003; Tufnell & Crickmay, 1990/93). From the shared kinetic qualities a sense of intersubjectivity develops that is not informed by conceptual or representational systems. Proprioception of kinetic elements within the moving body are “embedded” in the perception of self and thus contribute to an embodied experiential self.

Kinaesthetic engagement in non-conceptual shared space, time and weight allows direct movement reactions. A similar, primary kinaesthetic responsiveness has been described as tensional dialogue, ‘dialogue tonique’ by De Ajuriaguerra and Angelergues (1962 p. 21, as quoted by Corraze, 1997) in their psychomotor view on the early interaction pattern 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, Fabbri-Desto, & Cattaneo, 2009; Berrol, 2006; Calvo-Merino, Grèzes, Passingham, & Haggard, 2006).

The Social Brain: modulation by experience

The brain is a developing organ (Schoore, 1998). The brain organisation is shaped by experiences and vice versa, the structure of our brain organisation modulates experiences (Schoore, 2003; van der Kolk, 2003). Plasticity and connectivity of neural circuits are the result of close interaction of biological maturation of matter and experiential shaping of matter (Keysers & Gazzola, 2006).

As experiencing is bound to the embodied self (Rochat, 2002), the social templates of brain/neuronal structure are the result of embodied relational experiences (Jonsen, Churchland, Damasio, Moreno, Schaffner, & Mobley 2002). We might therefore expect that the neuronal wiring of the brain will develop new pathways for action recognition and social relatedness by embodied experiences that combine perceptive and proprioceptive sensory input. Therefore in cases of disturbed early

intersubjectivity, compensational intervention might support relational engagement and provide intersubjective experience (for a similar concept see “Nachsozialisation” proposed by Petzold, 1988, p.236).

Dance duet improvisations address the specific functionality captured by the Mirror Neuron System (MNS) and shared neuronal circuits. The interplay of sensori-motor components during kinaesthetic partnering is characterised by the sensory simultaneity of feeling my body move whilst seeing my movement, or hearing the sounds of my movement. In the simultaneous processing of sensations coming from within the body and impulses coming from outside the body is the (putative) mirror neuron system, which has been suggested to play an important role (Gallese, 2003; Bråten, 2007). Observed action is matched to self-performed action. Keysers and Perret (2004) suggested that the neuronal networks are shaped by simultaneous co-operating groups of neurons; through Hebbian learning cells that fire simultaneously will build shared neuronal circuits.

In a study with expert dancers Calvo-Merino et al (2005) showed that the observation of expressive movements led to MNS activity. The dancers showed stronger brain activation when watching a movement style in which they were trained and thus it was within their personal movement repertoire (2005). During the observation of dancers, proprioception is activated more whilst watching familiar movements. Personal movement experience contributes to plasticity in the involved neuronal circuits (Calvo-Merino et al, 2006). This might lead towards the hypothesis that MNS could be looked upon as an inherited potential of the human brain that can develop throughout life by experience.

It should be taken into account then that social emotional development is not only defined in terms of behaviour but also in terms of a maturing and developing social

brain (Sommerville & Decety, 2006). Indeed, brain imaging techniques have shown that adolescence is a sensitive phase for the social brain, as in this phase brain matter and organisation go through a major shift (Blakemore, Ouden, Choudhury, & Frith 2007; Crone, 2009).

The proprioceptive and perceptive traces of kinaesthetic partnering contribute to body memory (Morrissey, 2008), which is not a static entity, but is characterized by kinetic properties, which define a dynamic process. During kinaesthetic partnering the perceptive traces are not limited to the subject's body and movements, but they also include memories of the moving dyad. Thus a kinaesthetic memory, or to use Stern's words, "representation of interaction that has been generalised" (Stern 1985, p. 112), a "being with" (ibid., p. 111) and a "feeling felt" (Siegel 1996, p. 149), is generated to the subject's implicit, embodied patterns of being with others.

Kinaesthetic intersubjectivity in dance movement psychotherapy

Dance movement psychotherapy (DMP) actively addresses the body-informed intersubjectivity we have described above. The therapeutic relationship is achieved through movement and dance (Payne, 1992). The therapist will route the therapeutic relationship into kinetic intersubjectivity by using shared movement as a specific intervention (Samaritter, 2010). In the shared movement situation the therapist uses her own bodily movement to 'meet' (Payne 1992) the movement patterns of the patient. In this corporeal relationship the therapist initially connects with the patient's movement patterns, mirroring them with highly attuned movement patterns. In cases of pathological self-organisation or self-regulation the patient may not be able to initiate engagement in a mutual relationship. During the one-sided intentionality from the therapist towards the patient, the aim is to bring about bodily-based change in intention and attention. The patient is offered a visual and acoustic impression of

her/his personal movement material through the attuned movement intervention of the therapist, whilst at the same time s/he is experiencing her/his own movements through the kinaesthetic senses. The therapist may support the patient's kinaesthetic, direct perception of the dance by offering, through her movement, changes in the kinetic qualities such as a shift of rhythm or movement direction, change of spatial position or use of weight (Samaritter, 2009). Participating in the kinaesthetic partnering the patient is capable of affecting and regulating the shared kinetic qualities through the movement s/he contributes to the duet. This activity is similar to the awareness that dancers use to address and attune their movements towards a partner in dance improvisation as an art form in duets and group performances (Tufnell & Crickmay, 2004; Fuchs & Gambling, 2009). Through his/her movement actions the patient, as a duet partner, comes to experience her/himself as an intentional subject that is met by the responsive attitude of the therapist. From shared movement qualities the movers develop towards a relational mode that is still characterised by intentional attunement to each other, and through interplay or counterbalancing of movement patterns a quality of dialogue is achieved. During the non-verbal relating through kinetic qualities during the therapeutic dyadic relation the patient-therapist duet connects to preverbal structures of interaction that we have described before as kinaesthetic intersubjectivity (Samaritter, 2010). For the therapy situation accounts the same as for the dancing dyad, the experience of mutual responsiveness through kinetic structures contributes to embodied memory traces (Fuchs, 2000; Morrissey, 2007; Brandstetter, 2007). According to a Hebbian perspective we would expect that these experiences also shape then the neuronal structures involved (Keysers, Kaas, & Gazzola, 2010; Calvo-Merino et al., 2006).

Dance movement psychotherapists use movement analysis to capture the patient's

movement patterns in movement profiles. Dance movement diagnostic instruments are typically based on Laban Movement Analysis (Laban, 1980; Bartenieff & Lewis, 1980). Movement profiling allows a notation of bodily and spatial organisation as well as combined kinetic qualities from the aspects space, time, weight and movement flow (for an overview on Laban based movement diagnostic instruments see Koch & Bender, 2007). The Kestenberg Movement Analysis (Kestenberg-Amighi et al 1999) allows the profiling of the patient's movement in relation to the therapist, group-members or partner as expressed in shape-flow patterns and tension-flow rhythms. The movement profiling is processed through the incorporated empathetic movement resonance of the observer, who notates the movement characteristics through drawing movement traces. Movement profiling prior, during and post therapy allows changes in movement behaviour over time to be monitored.

Kinaesthetic intersubjectivity: the special case of autism

Atypical social engagement in autism has shown to have an impact on these person-to-person relations from early developmental stage (Rogers & Williams, 2006). It has been observed that children with ASD show:

- diminished interpersonal exchange (like eye-contact, imitation of simple body movements, as well as symbolic imitation)
- diminished attention to environment (synchronising, pointing, joint attention,).

Of all the dimensions in the appearance of autistic traits the lack of social orientation and relating is probably the most significant. It is a core marker through all the diverse phenotypes (Kanner, 1943; 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, as 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, Happé, Brunswick, Fletcher, Frith, & Frith, 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 (in)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). Also due to the atypical development of intersubjectivity a lack of (relational) experience and from that atypical "ways of being with" (Stern, 1985, 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, Hobson, & Nash, 2000).

After 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. Rogers and colleagues (1996; 2006) 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 (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 to the eyes etc. Rochat (1998) had shown that early body organisation and body image arise in typical developing children from the repetitive self-observation. The repetitive stimulation of kinaesthetic senses and visual self-perception in ASD might be understood as an attempt to establish a notion/feeling of the boundaries of the body and to generate a feeling of sameness.

This bodily anchored sense of self would then not be an interpersonal one as in typical development (Stern, 1985) but a solipsistic one. Hobson (1990) suggested that the development of an interpersonal self might be impaired in autism. He points out that children with ASD do not develop a concept of self matching the separated other, as they “fail to be aware of themselves in the minds of others” and “fail to understand the nature of other persons who have their own psychological orientation toward the world” (ibid., p. 174).

In the research studies on spontaneous gestures of social engagement autistic children and adolescents were offering less spontaneous verbal and non-verbal gestures of greeting and farewell. Autistic subjects responded less often with eye contact when offered a greeting and fewer children smiled when waved good-bye (Hobson & Lee, 1998). Studies on gestural interpersonal engagement during interviews with adolescents with ASD showed appropriate use of gestures, but the feeling of intersubjective exchange in the communication partner differed significantly between the groups of typical and ASD adolescents (Garcia-Perez, Lee & Hobson, 2007). In earlier studies, Dawson and Galpert

(1990) showed that social orienting behaviour in children with ASD increased after their mothers had imitated them during play situations.

Field, Sanders and Nadel (2001) showed that imitation by an adult changed non-verbal engaging behaviour in children with ASD. Of six rated items of non-verbal engaging behaviour (looking at person, positive facial expressions, negative facial expressions, positive social gestures, close proximity and touching) five items occurred more often after imitation of the child by an adult. Escalona et al (2001) found in a similar study that the children after imitation spent less time in gross-motor movements and showed increased frequency of physical contact behaviour (spatial closeness, touch). These results suggest that imitation of the child's movement by an adult might offer a useful potential in the early intervention of children with ASD to support the development of social engagement.

Programmes for early intervention picked up on these studies. Rogers et al (2003) showed that early imitative intervention changed the frequency of initiating contact by the autistic child. Early intervention programme at the MIND institute gave positive results concerning social engaging behaviour of the autistic child (Carpenter, Pennington & Rogers, 2001).

Ingersoll, Lewis and Kroman (2007) showed that teaching imitation and spontaneous use of 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. From a kinaesthetic perspective the question then arises whether a body and movement oriented intervention using early developmental forms of synchronising with the movement patterns of the child could bring about more non-verbal social and interpersonal orientation in children with ASD. 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).

DMP in Autism Spectrum Disorders

DMP is known for a wide range of body-oriented and movement interventions (Lewis, 1979; Stanton-Jones, 1992; Payne, 1992, 2006; Levy, 1992; Meekums, 2002) with diverse psycho-social and psychiatric problems. The clinical DMP intervention “Shared Movement Approach” (SMA) has been described as a method for psychotherapeutic intervention in disorders with a disturbed sense of self, like in attachment trauma or autism (Samaritter, 2010). In this developmentally informed type of DMP the therapist actively addresses non-verbal attunement between movers. The aim of the intervention is to bring about relational movement experiences in patients who do not have a clear sense of self and whose self perception is not anchored in embodied experiences (Erfer, 1995; Loman, 1995).

SMA addresses the mutual engagement at a level from which the child is capable to engage. This orientation to resources is facilitated through the therapist’s bodily sensitivity to, and knowledge of, movement analysis. The child’s assessed movement profile outlines the movement capacities and strengths and helps to identify the gaps in the movement repertoire (Loman & Foley, 2003). Moreover this analysis provides the potential possibilities for the interaction partner/therapist to join or meet with the kinetic patterns of the patient. The therapist shapes the movement intervention according to this information. The therapist arranges the situation for the participants to be invited into movement activity. S/he offers sufficient containment for the participant to bear the non-verbal contact and organizes the situation in a way that stimulates the child’s intrinsic developmental impulse. Attention is directed towards the patient’s kinaesthetic perception. In the therapeutic situation non-verbal synchronisation and inter-corporeal relating are major techniques used by the therapist for establishing and maintaining contact and relationship. The therapist is

mirroring, matching and challenging the child's movement through kinetic qualities like rhythm, weight and direction. The spontaneous movement reaction of the child to the situation offers the potential to reconnect with an autonomous developmental process (Samaritter, 1990). Through this non-verbal relating in kinetic qualities the therapist and client connect in pre-verbal structures of interaction that have been described as embodied intersubjectivity (Samaritter & Payne, 2010). The patient experiences her/himself as an animated, acting subject capable of co-regulating the intersubjective relationship. Kinaesthetic experiences are wired through direct perception into the patient's organisation of the perceptual and proprioceptive body. The customary movement patterns thus are brought into a new relational context. These bodily-enlivened participatory experiences offer new 'ways of being with' and contribute to new body memory on interpersonal movement repertoire.

Movement analysis during dyadic activity with patients with ASD provides the opportunity to look at 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 those with ASD (Sossin & Loman, 1992).

The outcomes of DMP interventions as described in clinical case studies show strong resemblance with the effects of imitation on the social engaging behaviour in those with ASD as described by Escalona, Field, Nadel & Lundy, (2002). Therapists report that during the intervention the child shows more sensori-motor organisation and a reduction of fragmented perceptions and movements during movement activities. They also report an increase of intentional movements going from the child towards the therapist or caregiver (Erfer, 1995; Loman, 1995; Loman & Foley, 2003). Also creative movement therapy has shown positive effects on the sensori-motor organisation of the child with ASD (Hartshorn, Olds, Filed, Delage, Dullen, & Escalona, 2001). Research studies have shown that imitation of the child with ASD by an adult researcher or parents/caregiver has a positive effect on the child's social relating patterns (Field, Sanders, Nadel, 2001). The imitation used in these studies comes close to the mirroring intervention in DMP described before but has not yet been researched in the dynamic context of the DMP setting.

For the development of the child with ASD these outcomes are important. Interventions that improve the ability of the child with ASD to attune with others will help the child to take part in social interactions with peers, like during sports, communication and play situations. If this attunement is improved, the child will have a greater chance to participate autonomously in social interactions and thereby be more independent from caregiver's intervention.

Internationally, research into ASD focuses more and more on possible interventions to alter the impact of the condition on a child's development; with a strong focus on interventions to support communicative capacities in the child with

ASD (Chiang, Soong, Lin & Rogers, 2008; Hobson & Hobson, 2008). DMP might offer a compensational intervention for the child with ASD to support relational engagement and provide intersubjective experience.

Consequently a study on how to support non-verbal attunement in children with ASD might be of value. Improved attunement to the non-verbal behaviour of communication partners may increase the possibilities for the ASD child to take part in social situations and could lead to more autonomy in social interaction. Such a study is proposed with the following questions:

- a) Does SMA intervention increase actions of social orienting movements of the participants (e.g. eye-contact) – as drawn from movement profiles?
- b) Does SMA intervention have an impact on social behaviour profile as drawn e.g. from parental questionnaires?
- c) Does SMA intervention have an impact on the neuronal activation profile as drawn from fMRI scans?

Conclusion

In this paper we propose a kinaesthetic perspective to intersubjectivity. A model of kinaesthetic partnering has been introduced to describe mutual attunement and understanding during early dyadic interaction. Body-informed intersubjectivity emerges from attentive, kinaesthetic orientation towards a shared "in-between", that can be a gesture, movement quality or shared movement theme. In the co-creation of interpersonal relatedness the dancers come to experience themselves as intentional subjects through their impact on patterns and movement qualities of the shared movement. The moving body, that is, the acting and perceiving body, generates experiences of shared kinetic qualities through shared space, rhythm or weight.

Differentiation from shared corporeality can lead towards the experience of agency and bodily anchored self.

The “Shared Movement Approach” has been presented as a clinical application of these concepts in the treatment of children with ASD. Further research is proposed to investigate the effectiveness of a DMP intervention focussing on the question of whether SMA interventions result in increasing non-verbal interpersonal attunement and engagement in children with ASD.

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