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## Autism, sympathy of motives and music therapy

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# Autism, sympathy of motives and music therapy

Colwyn Trevarthen\*

## SUMMARY

*Music therapy helps mental functions and learning of autistic children by engaging with and supporting the core weakness in coordination of motives, not by giving cognitive stimulation or training in the perception of musical time or in communication by melody. The child is guided to make sympathetic responses to the pulse and quality of other persons' movements. The same rhythmic sense and self-expression in narrative as infants show in protoconversation remains as a receptive resource inside the confused consciousness, wayward emotions and impulsive motility of autism. Improvised musical engagement stimulates episodes of concerted activity and brings this receptivity to life, regulating anxiety, aiding coherent awareness and memory and helping the child to enjoyable contact with persons and more comprehensible communication. Musical acoustic methods allow precise research into how music therapy works as treatment, and can validate its applications in assessment or diagnosis.*

**Key-words :** Autism, Music therapy, Motivation.

## RÉSUMÉ

Autisme, sympathie des motifs et musicothérapie

*La thérapie par la musique facilite le fonctionnement mental et les apprentissages des enfants autistes en ce qu'elle mobilise et fortifie la coordination des motifs, et non en ce qu'elle apporterait une stimulation cognitive ou parce qu'elle entraînerait à la perception du temps musical ou à la communication par la mélodie. L'enfant est guidé vers la production de réponses en sympathie avec l'intensité et la qualité des mouvements des autres personnes. Le sens du rythme et l'expression personnelle que les enfants manifestent dans la protoconversation comme dans les narratives reste une ressource réceptive au profond de la conscience confuse, des émotions négatives et de la motilité impulsive de l'autisme. Les improvisations musicales encouragent les épisodes d'activité concertée et apporte cette réceptivité à la vie, régulant l'anxiété, contribuant à une conscience et une mémoire cohérentes, et encourageant l'enfant au plaisir*

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*du contact avec des personnes et à une communication plus compréhensible. Les méthodes musicales acoustiques permettent une étude précise des éléments qui font de la thérapie musicale un traitement adapté, et peuvent valider son utilisation dans l'évaluation et le diagnostic.*

**Mots clés :** Autisme, Musicothérapie, Motivation

#### INTRODUCTION: THE NATURE OF AUTISM, AND HOW ENHANCING MUSICALITY CAN HELP

Autism affects the coherence and flexibility of motivation and consciousness (Condon and Ogston, 1966). It reduces the impulse of awareness to seek new experience, and the capacity of a child's purposes to react in novel, creative ways to the contingencies of experience. The difficulties in relating to other persons that children with autism suffer, and that so profoundly affect their relationships in the family, with other children and with strangers, are linked to a disorganisation of those very purposes and interests that distinguish human beings and that animate cultural learning (Trevvarthen, 2001). Autistic children have difficulty being aware of the intentions behind other persons' actions, with comprehending the tools people use and with distinguishing the meanings of language (Trevvarthen *et al.*, 1998). Other people feel that the company of children with autism lacks companionship. Nevertheless, the autistic child is sensitive to how others behave. If the demands put upon them do not exceed their capacities for imagining others' intentions and awareness, and for keeping up with their feelings, children with autism show affection, form attachments, imitate and cooperate (Nadel, 1992; Tiergerman and Primavera, 1984; Trevvarthen *et al.*, 1998).

As with other neurodevelopmental disorders, autism affects functions of the body, not just behaviour and mental life. Autonomic regulations are weakened as well as the core processes of intentionality and consciousness. Difficulties with sleep, digestion, with setting of sensory thresholds, with pain and stress and with emotional equilibrium add to the tasks of a parent or teacher in providing care for an autistic child.

Improvised, responsive or "creative" music therapy (Nordoff and Robbins, 1968, 1977), by mirroring the core impulses of motivation and emotional states, offering rhythmic coherence, continuity and balance of emotional change and a "narrative" of feeling, can reach the sensibilities of an autistic child and give form and consistency to motivation (Aldridge, 1996; Robarts, 1998, 2000; Tiogo, 1992; Wigram, 2000). It can improve disturbed autistic children's alertness, calming excesses of action, and giving coordination to movement. It can open awareness for all communication, facilitating meaningful speech for those with little language. It can aid regulation of emotion and moderate the bodily expression of moods, reducing anxiety

and stress. Because musical communication employs direct embodiment of motivation, carrying signs of the intrinsic timing and energetics of movements made by body, limbs, hands and voice, it becomes part of the self-awareness of the participants. It makes a bridge between the child's inner life and the intuitions and interpretations of the musician/therapist, who is trained to sense, consciously respond to and develop the mood and purpose of every initiative of the person in treatment, and what they create together.

Scientific evidence for the processes of mirroring and dynamic affective exchange that form the essence of this non-verbal, performative level of human interaction and its rich emotions has come in recent decades from research on mother-infant communication, and has led to the formulation of a theory of "communicative musicality" to explain the foundations of sympathetic action between communicating human beings (Malloch, 1999). This work has enriched our understanding of what interpersonal awareness or intersubjectivity is. It helps us perceive the problems faced by a confused and withdrawn autistic child in a busy and impatient human world.

#### INTERSUBJECTIVE IMPULSES MOTIVATE SPONTANEOUS LEARNING IN COMPANIONSHIP FROM BIRTH

In research on communication in infancy, the leading question is, "How does a baby become aware of other persons and what they are doing?" Not how does an infant perceive some kind of "event", "thing" or "object", still or in motion—the first question that cognitive psychology asks. The important question about the infant's awareness is this: how does he or she know when "it" out there is a person, with whom one might sympathise in feelings and experiences, and communicate. This is what is meant by "intersubjectivity"—the human being's ability to be a conscious and voluntary subject in companionship with another human subject (Trevarthen, 2001, Trevarthen and Aitken, 2001). Intersubjectivity is the psychological ability to have and share "purposes", "interests" and "emotions", to be ready to exchange these intrinsic psychological events with other persons, so to gain new ideas and goals from them (Aitken and Trevarthen, 1997).

Academic concepts such as "theory of mind" or "social cognition" limit the question, confusing the knowing of persons with knowing unpsychological things and events. They neglect motivation, as well as intersubjectivity based on direct detection of the motive principles that make other people do what they are doing. Both motivation and intersubjectivity are weakened in autism.

Descriptive research has shown that an infant knows that a person is not an object by detecting the motive source of their movements in the time and space of their body (Stern, 1990, 1992, 1999, 2000; Trevarthen and Aitken, 2001). The infant expects to communicate with human impulses, to

receive a contingent response to any attempt to address the “Other” (Beebe *et al.*, 2001; Nadel *et al.*, 1999). Newborn infants respond socially to a human voice, the expression of a face, the touch of a hand, or the feeling of being picked up. A newborn may smile or turn when a mother speaks, but not to another woman’s voice. The “melody” or “poetry” of her voice identifies the speaker the baby heard intimately before being born. The newborn is attracted to gentle rhythms and a tone that identify a positive human affection and joy. A prematurely born baby can join in intimate tactile and vocal communication (Malloch, 1999; Trevarthen, 1999). Newborns imitate face expressions, sounds and hand gestures with anticipation of a response, attending closely when a human expression is offered to them, then repeating the identified expression or gesture when “asked” to do so by the adult “waiting and watching” (Kugiumutzakis, 1999). When the adult does not respond to the baby’s imitation, the baby may make the imitated act again to “provoke” a response.

Two-month-old babies look at eyes with focussed interest and take part in “proto-conversations”, timing their looks, smiles, prespeech mouth movements, hand gestures and coos to fit the rhythm of the mother’s “baby talk”. The mother feels sure the baby is trying to “talk” with her, and “tell a story”, and, indeed, the baby is clearly interested in the rhythm and flow of the emotional narrative of expression in the mother’s talking. Experiments show that the young infant is “expecting” an immediate sympathetic response. In a few weeks the baby will be taking part in lively games, responding eagerly when the mother sings a song with dancing rhythm and accompanying hand movements, quickly learning the rituals and tunes (Trevarthen, 1999).

Study of these rhythmic and melodic signs of readiness for human communication confirms that there is a “pre-language” of intentional impulses and emotions (H. Papousek, 1996). The dynamics of the behaviour seems like the common essence of speech, music, dancing, poetry, and drama. Its motives have been interpreted to be the origin of language, ritual and art (Dissanayake, 2000). In other words the musical consciousness of the infant, the way the body expresses itself in movement and excites other’s to respond, is preparation for being part of a human culture or way of acting, and for developing cognitively and temperamentally as the community expects (Gratier, 2001).

MUSICALITY, THE EMBODIMENT OF MOTIVES AND FEELINGS  
IN NARRATIVE MIND-TIME, IS THE BASIS FOR HUMAN COMMUNITY  
OF KNOWLEDGE, BELIEF AND SKILL

Psychological research has disclosed that a baby less than 6 months old can hear and distinguish human voices and musical sounds remarkably well. Almost every kind of basic musical difference that a musician might

find interesting—of rhythm, pitch, harmony, melody, or quality (timbre)—can interest an infant (Fassbender, 1996, Papousek, H., 1996; Fernald, 1992). This gift for hearing natural or artificial human sounds as music must underlie the infant's easy recognition of people and their feelings from their voices. That must be what it is for. Infants also attend to hand gestures, which are naturally rhythmic in the same way as a voice is. All human beings “talk” with their hands, and babies look at manual expressions, while making similar coordinated patterns of hand expression from birth. Music is the form of human communication that, in dance, song and instrumental performance, employs all these expressive talents (Trevarthen, 2000; Trevarthen and Malloch, 2000).

We have been using techniques of musical physics to observe in detail how the voice of a mother and the voice of a baby work together to share talking or a song, how they hear each other's “message” (Malloch, 1999, Trevarthen and Malloch, 2000). Adult and infant have the same sense of “time in the mind”, both co-ordinate many parts of their own body to make rhythms of expression that synchronise with what they do with their voice, and the two can make their sounds and gestures synchronise with or complement each other with equal accuracy. They behave like two competent musicians improvising together, without no score (H. Papousek, 1996; M. Papousek, 1996). To do this baby and adult must have a matching sense of the time of action and experience, and the variations in pitch, loudness and quality of their sounds must tell similar “stories”—they must be playing in the same field of emotional meaning.

These abilities, all together, comprise what Stephen Malloch (1999) has called “Communicative Musicality”. We find that a baby is born with a strong sense of the Intrinsic Motive Pulse and Future Sense of human moving (Trevarthen, 2001; Trevarthen and Aitken, 1994). The infant has the emotional qualities of human feeling, and an eagerness to share them. An innate appreciation of the “dynamic emotions” of human movement, and especially their expression in the voice, is combined with awareness of the evolving “emotional narrative”—how the quality of feeling changes in cycles or slow waves of arousal and vitality, to round out episodes in a “melodrama”. Thus, when a mother sings the verse of a baby song that has four phrases (lines), a pulse of *andante* or *adagio*, an iambic rhythm, rhyming syllables, and a melodic line that falls mainly in the octave above middle C, the baby waits attentively. As the drama unfolds the baby joins in by moving, smiling or vocalising, often cooing at the end of the line on a syllable that rhymes with a previous ending, or most emphatically at the end of the whole verse (stanza) ñ which is a complete small story lasting about half a minute. In any language, this is the kind of adult performance that draws applause from the baby. The baby's enthusiasm encourage the adult to play the game many times. Repeated songs quickly become favourite ways of being together, and the infant displays pride in knowing how to play a part.

Acoustic analysis of recordings of mothers' speech and song in several languages, reveals how an infant's hearing of rhythms, qualities and narratives in an adult's melodic talking or singing can facilitate the future development of the child's ability to speak a language, and it helps us appreciate how a toddler senses what a parent, friend or teacher is talking about or showing (Malloch, 1999; H. Papousek, 1996). We believe that the theory of musicality helps explain the nature and origins of human intersubjectivity in all its forms. It can have useful applications in education, and in the study and treatment of emotional and neuro-developmental disorders of both adults and children. Musicality integrates the processes of the mind together and makes them communicable. This is where it has special value for a child with a developmental disorder of motivation, or one who has not had appropriate parental support.

#### AUTISM AFFECTS INTERSUBJECTIVITY AND CULTURAL LEARNING IN LATE INFANCY

Autism, in common with other developmental disorders of the brain, is not reliably diagnosed until some time after birth (Trevvarthen *et al.*, 1998). In early infancy, when communication is mediated by sympathetic negotiation of rhythmic vocal, facial and gestural signals, the signs of autism are uncertain and essentially indistinguishable from first manifestations of other pathologies of mental development.

Neuropathology reveals no one local problem in the brain of an autistic child, and psychologists offer different views on the nature of the disturbance in neural function. The list of abnormalities found is as widespread in loci of the brainstem, limbic and neo-cortex and cerebellum as the "emotional motor system" itself, and includes systems known to play a part in dynamic processes of consciousness and learning (Panksepp, 1998). Affected parts also include sites, notably in the right hemisphere and frontal lobes of the cerebral cortex and in the cerebellum, that are implicated in perception of the communicative expressions and states of mind of other persons (Trevvarthen, 2000). All the human "cultural skills", of language, thinking and cooperative action, which schooling is designed to cultivate, depend on the normal functioning of a core "intrinsic motive formation" (IMF) of the "emotional brain", and the sympathetic behaviours which it regulates (Trevvarthen and Aitken, 1994). This mechanism also regulates the maturation of the neocortical systems that assimilate experience. Developments in the brain after the end of the first year, which normally lead a child towards proficiency in the culture's meanings and its "mother tongue", are impaired in autism.

Kanner (1943) placed "a biological disturbance of affective contact" in first place as the cause of autism, and noted, in addition to the child's ina-

bility to establish social relatedness or “aloneness” and a failure to use language normally for the purpose of communication, an obsessive desire for the maintenance of sameness, and a fascination for certain kinds of stimulating objects and gadgets. He identified the age of appearance as “before 30 months”. This is a crucial stage in a normally developing child’s transition from preverbal communication, social self-consciousness, imitation, and cooperative and imaginative play, to rapid acquisition of language with narrative memory, and mimetic identification with many conventional ways of understanding and acting. Autism can be diagnosed in the second year, before language, when all thinking and imagining is involved with emotional expressiveness and social sharing of behaviours (Trevvarthen, 2000).

Modern diagnosis refines Kanner’s definition, adding ideas on cognitive processes, but there is agreement about the social detachment and obsessional behaviour of autistic children (Hobson, 1993; Howlin, 1998; Trevarthen *et al.*, 1998). Level of language and of cognition or intelligence are generally lowered, but vary widely (Jordan, 1993). There may be selective retention of an intellectual skill dependent upon sustained interest in one line of self-regulated learning. The ritualistic, stereotyped exploration of objects and insistence on sameness seem to be manifestations of a restricted “seeking” motivation (Panksepp, 1998), or they may function as defenses, protecting the child from invasive experiences or novel situations that he or she cannot understand or predict and that precipitate anxiety or panic. In either case “declarative memory” and “executive functioning” are compromised. The vulnerability of an autistic child to invasive sensations and confusion of awareness point to a fault in generation and regulation of motivation for new experience.

Autistic pre-school children all have difficulty relating to others as persons, and in recognition of emotions in others. While not insensitive socially, they fail to show the usual empathic reactions when other persons show pleasure, fear or pain. As toddlers, they did not understand the narrative connections in a story that convey how people act and feel about what happens (Jordan, 1993; Rollins, 1999). This is not so much a cognitive or intellectual failure to understand the mental states of others, as an inadequate sympathetic response to the motives expressed in others’ attitudes, actions and expressions. Speaking, *i.e.* “high functioning”, autistic youngsters fail to understand questions about other persons’ knowledge and beliefs that normal 5-year-olds find easy to grasp, and this has been identified as a disorder of “meta-cognition” or “interpersonal perspective taking” or “thinking on thinking”, especially “thinking on other persons’ thinking” (Astington and Jenkins, 1999). Autistic children, have weak interpretation of what characters in stories can imagine from their experiences. Such tests or demonstrations of “theory of mind” failure apply only to individuals who understand language and speak. They do not explain the “joint-attention” and “mutual attention” problems of an autistic 2-year-old, an age when no child has “a theory of mind”.



Autistic children explore objects compulsively, and show peculiarities of looking and listening. While they are often hypersensitive or easily overwhelmed and unable to shut out adverse experiences by attending elsewhere, they also show strangely blunted reactions to stimuli and are likely to not notice things that one would expect to be of great interest or concern to a child. They develop habits of repeating self-stimulation, and tend to fear novelty and change, being easily panicked by complex new situations. These features confirm that there are problems with the ways their brains admit or select stimulation that are linked to abnormal initiative and planning of movement. Autistic children may also be hyperactive with ritualistic activities—strange gestures, hand-flapping, blinking, fiddling with things, repeatedly tapping. Many have some degree of motor weakness and are delayed in motor milestones. They do not point communicatively and may not understand the gestures others use to direct their attention. Like the peculiarities of perception, the abnormal spontaneous movements of autistic children indicate faulty brain processes, but these are not individually peculiar to autism. Many disorders of the young brain are associated with repetitive involuntary movements.

The manifestations of autism in early pre-school years, and responses to interventions, give strong indication that early diagnosis and early remedial education are highly desirable. The most informative and reliable diagnostic instruments are those that examine the ways the young child uses objects in the context of communication with familiar others. They record both object use and interpersonal behaviours (Trevvarthen *et al.*, 1998).

COMMUNICATION THROUGH MUSIC CAN ENGAGE  
AND ORGANISE AN AUTISTIC CHILD IN MOVING AND FEELING,  
AND IS EFFECTIVE FOR BOTH THERAPY AND DIAGNOSIS

Modern developmental psychology shows that the classical psychodynamic theory of Mahler or Klein underestimated the young infant's self-organisation and capacity for interpersonal awareness (Stern, 2000). Methods of supporting emotional functioning, communication and learning now address more directly the motives that the child inherently brings to relationships (Alvarez, 1996; Haag, 1984; Meltzer, 1975; Tustin, 1981). They are sensitive to the feelings of fragmented body- and self-awareness and weak perceptual grasp of objects and the behaviours of other persons that some autistic adults describe vividly (Grandin, 1997; O'Neill, 1998; Williams, 1996). Children with autism have trouble imaging or "representing" the form of their bodies and how their body movements can be coordinated and addressed to investigate surroundings, and they may even show signs of not recognising parts of their bodies as belonging to themselves (Anzieu, 1995; Haag, 1984; Tustin, 1981). This accords well with ideas

of a core function of “embodiment” or “somatic marking” underlying the functional coherence and dynamic coordination of the mind (Damasio; Varela *et al.*, 1991). It also makes sense of the social difficulties of people with autism, when one recognises that all intersubjective contact between human beings is mediated by movements of the body, as a whole and with differentiated partial movements of expression (Aitken and Trevarthen, 1997; Bråten, 1998).

Clinical case studies of autistic children describe bouts of excessive and impulsive running, jumping, or spinning round, exaggerated stillness, or obsessive repetition of actions leading nowhere and sometimes provoking wild emotions of frustration and distress (Alvarez and Reid, 2000). The source of spontaneous activity and its monitoring and guidance by the senses is disturbed. Failure in generation of purposeful movement and systematically deployed awareness appears to be the fundamental problem, rather than the more specific disturbances in learning, thinking and communication that are most often measured by psychological assessments. The insights and clinical experience developed by psychodynamic practitioners can be brought into harmony with more conservative or objective approaches to individual cognitive and emotional dysfunction if both accept that there are inborn non-verbal intersubjective needs in human persons of all ages (Alvarez, 1992).

Music can directly address these problems of moving, sensing and feeling. Human impulses are expressed directly and communicated powerfully with singing or playing on musical instruments. A musical response is possible for a child who has severe physical, intellectual or emotional handicap. Improvised music therapy which is immediately responsive to any musical “utterance” the child may make can engage the pleasure in human contact and promote intimate and developing communication, engendering a relationship of affection and trust, and encouraging more coherent purposefulness, awareness and memory. It has special value when verbal communication is severely reduced or impossible.

Music engages the central coordination of body movement by mimicking its dynamics (Aldridge, 1996; Nordoff and Robbins, 1968, 1977, 1999; Pavlicevic, 1997; Robarts, 1998, 2000; Rosvold, 1998; Ruud, 1995; Wigram, 1996). It is an effective medium to gain therapeutic access to the disorganised motives of an autistic child, and to meet the child at a point where coordination is working sufficiently well, and development can be supported. It can complement, reinforce, give continuity to or modulate emotions that arise from confusion of initiatives and inadequate monitoring of the experiences of moving. It can break into the isolation that renders communication with an autistic child fragile and unproductive.

The physical/acoustic analysis of vocal communication has brought to light the principles of timing, emotional expression and narrative that universally mediate in interpersonal contacts and relationships, and the same principles can be extended to observe the quality of communication by

touch or gesture. Research on the methods and effects of music therapy and movement therapy is becoming more accurate and scientifically controlled (Aldridge, 1996; Pavlicevic, 1997; Wigram, 1996), and its benefits have been demonstrated for many conditions, including autism and other emotional disorders of childhood (Oldfield, 2001; Robarts, 1998; Wigram, 1996). Assessment of communication can be made in music therapy (Pavlicevic and Trevarthen, 1998). Analysis of music therapy sessions can reliably and sensitively diagnose autism, and distinguish individual forms of the disorder (Oldfield, 2000; Wigram, 1999, 2000).

Effective treatments for autism, or for any conditions that compromise the cerebral systems of collaborative learning, give targeted support to weakened motive states and awareness of self and others. They require responsive adaptation of caregivers' and teachers' behaviours to the abnormal regulatory needs of the child (Trevarthen and Aitken, 2001). A stable, clearly structured and protective environment and consistent daily routines are important, but instructive training of an autistic child in acceptable habits and cognitive and practical skills is not enough to develop their human potential. The child's motives have to be supported directly, and difficulties with physiological self-regulation compensated. An important advantage for the teacher in this task comes from the retention in even very severely affected children, of a level of sympathetic emotion and "mirroring" of behaviours and their dynamics. Psychosocial or interpersonal techniques that "meet the child where they are", reflecting his or her interests, purposes and sensitivities, can help physiological regulation, emotions and learning. In the case of autism, such a wide diversity of social and intellectual capacities, and such differences in emotional experience and response exist that it is essential that each case be treated as an individual, with a personality that will respond in idiosyncratic ways to any kind of therapy or education (Alvares and Reid, 2001).

There is considerable disagreement concerning the efficacy of therapies for autism, and differences in the estimation of the improvement that can be generated (Howlin, 1998; Trevarthen *et al.*, 1998). Nevertheless, it is accepted that earlier interventions are likely to produce greater improvement than the same approaches used later. The Lovaas method of behavioural training and Schopler's structured educational environment outside the home have proven beneficial effects in some cases, but it is uncertain how they are effective. It is not clear how far the expressive manner of communicating reinforcements and negotiating routine procedures is critical to their success. A wide range of other approaches focus more specifically on interpersonal communication, family relationships and early interaction (Alvarez, 1996; Trevarthen *et al.*, 1998; Waterhouse, 2000). Most of these have not received "controlled assessment". Their operation is not captured by measurements of performance on pre-defined measures of intelligence, rational beliefs or cognitive flexibility.

In special education for older children, instruction in speech and language and in social skills are given importance. Speech therapy is not, by

itself, generally effective, except for high-functioning cases who need assistance with semantic and pragmatic difficulties (Jordan, 1993). For children with less capacity for communication, an approach that focuses on the underlying interpersonal problems is more effective. Emotional engagement and joint attention appear to have a more fundamental role in furthering language development in autism than instrumental use of language (Rollins, 1999), and this approach may be applied for clinical intervention to enhance communication skills in autistic children more effectively than any training in thinking or beliefs (Astington & Jenkins, 1999; Rollins *et al.*, 1998).

Improvisation music therapy is gaining acceptance as an effective way of gaining and regulating communication with even the most recalcitrant autistic youngsters (Robarts, 1998, 2001). It employs techniques of mirroring and enhancement or modulation of expression with the benefit of a trained musician's sensitivity for pulse and expression in gestures made by the patient. Imitative responses are found to be attractive to autistic children and can act as a bridge to collaborative play or communication, and improving the child's access to language (Tiegerman & Primavera, 1984; Nadel, 1992, Nadel & Pezé, 1993).

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