

The holistic learning outcomes of musical play for children with Down syndrome

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How music and song can enrich social interaction and develop motor, socio-emotional and cognitive development and speech and language skills



Introduction

Music regulates stressed systems and is one of the most powerful means of relaxing the body. It promotes a sense of calm and peace, dispelling fear and providing an environment in which bodily systems calm down, allowing efficient modulation of arousal.^[1: p.54] Regular rhythmical sounds with a slow tempo such as soft slow humming by a parent, or the slow movements of baroque and classical composers

calm and soothe both parent and child.^[1: p.119, 2: p.274]

Music is processed primarily in the right hemisphere and limbic system of the brain. As it is processed, the brain releases chemicals such as dopamine and other relaxants into the body, and induces changes in breathing rates and breathing patterns as the pulse of regular rhythm leads to relaxed breathing. Music engages the whole brain at both sub-cortical and neo-cortical levels and

requires minimal (if any) cognitive awareness. One does not need to think in order to receive and perceive the ebb and flow of the sounds of music.

Before birth

Neuroscientists are finding increasing evidence that sound, movement and rhythm contribute to the physical and psychological development of the unborn child. Although it does not yet understand language, the foetus absorbs the musical qualities of language that it hears through the mother's body: the tone, rhythmic patterns, melodic rise and fall, tempo and dynamics. These elements of music are conveyed principally through the mother's voice; but also the father's vocal input can have an important positive psychological effect on both mother and child.^[3: p.6]

Music for newborns

When parents sing a lullaby to their baby, the elements of repetitiveness, softness, simplicity and slow tempo generate a calming quality for both parent and infant. (Non-rhythmic noise causes physical distress, anxiety, inefficient task execution, lack of coordination and other problems deterring comfortable behaviour.^[1: p.169] Calming songs accompanied by gently rocking, stroking, or patting help promote the bonding process

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and aid in infant development by supporting neural development.

These natural and important responses to music are present in all children, whether they are born full-term or premature; whether they are typically developing or have developmental difficulties associated with Down syndrome, cerebral palsy or other conditions. In situations where there are developmental difficulties, music is not only developmentally useful for the children, but is also soothing and healing for the parent. Parents have spoken about the comfort they personally derive from such songs while at the same time knowing the lullabies provide their baby with the musical qualities of language; the phrasing, melodic flow and rhythmic patterns of the spoken word.

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Premature babies with feeding difficulties feed better when quiet music is played at mealtime, because they are able to suck or chew, swallow, and breathe with better coordination. Suzanne Evans Morris has found that when slow music is played, a previously disorganised and unsustained sucking rhythm tends to become more regular.^[2: p.279, 7]

A parent of a child born with Down syndrome told me that singing to her baby empowered her and gave her ways to express her feelings of sorrow, doubt, despair. It also allowed her to express hope and even joy, whilst developing a rich, meaningful relationship with her baby son. She said that singing and dancing with her baby was crucial for her own health and well-being. This mother noticed that her son began to watch and imitate her facial expressions when she sang to him and by three months began contributing meaningful sounds through their musical play.

Musical play

Musical play helps all children to make sense of sounds, sensations, sights, smells and tactile feelings. It can help children process more positive feelings about themselves and about learning when positive suggestions or experiences are provided through the use of the elements of music (rhythm, pitch, etc.) and specific music activities (rocking, singing, beating a rhythm, etc.). Music making helps children to communicate without the need to use language. It allows them to enjoy success because there is no 'right' or 'wrong' in music. They can have fun, problem solve (e.g. how to produce different sounds by tapping different objects), and anticipate (e.g., as they hear where the music is "going" in a familiar song or a new cadence). Through special songs, they can prepare for situations that they may find difficult or anxiety provoking, such as putting on clothes in the right order or preparing to get into the car. Through a range of simple songs that simply "sing the sequence" of actions that are to be done, a child can learn self-help and safety skills and perform tasks such as washing, dressing, or undressing or following routines such as stopping with a parent, or watching and waiting to cross the road.

Narrative songs which describe, moment by moment, what children are doing as they play, help children to make sense of their world. They provide rhythmic and expressive support so that the actions of the children are supported by the music as it structures the present moment.^[4] For example, as Olivia digs in the sand, her mother sings to the tune of "I'm a Little Teapot", "Olivia is digging, digging in the sand, pat, pat, pat, patting with the spade, filling up the bucket, tip it over, what a lovely castle you've made". When these sorts of narrative songs are sung throughout daily rituals and routines, they help children remember what they have done and contribute to the autobiographical narrative of their experience, thus helping to build a sense of self and who they are.



Three case studies of children with Down syndrome

Children with Down syndrome attend The Champion Centre in Christchurch New Zealand on a weekly or bi-weekly basis with their parents or primary caregivers. In the course of a three-hour morning, each parent-child pair engages one-on-one with up to six therapists. These include a speech and language therapist, a physiotherapist or occupational therapist, and an early intervention teacher (cognitive developmental therapist). In addition, each pair attends a learning through computer session, a supervised play session and a music session. Halfway through the morning, families come together for morning tea and a group music session. Further details about The Champion Centre programme can be found in "Beyond the Difference"^[5] (The Champion Centre, 2005) available through The Champion Centre website: www.championcentre.org.nz.^[5]

The music sessions described in the three case studies below were carried out in the context of the regular Champion Centre programme. It is important that the gains the children made are understood and interpreted in that context. Therapy is holistic at The Champion Centre, and music is an integral part of all the children's programmes. As the

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case studies suggest, music has a significant role to play in children's development, but clearly it is all the therapies working together that provide for the best outcomes for children.

Michael aged 4 years

Michael is a well-built child who has naturally low energy levels, floppy muscle tone, difficulty with upper-body coordination and a general lethargy of movement. He had marked difficulties with activities such as getting up from a squatting position and moving back down to the floor, marching, jumping and any fine motor activity (such as picking up small objects, using scissors, etc.). He sometimes joined in with "singing" but his words were unclear and the words he used were spoken in either a monotone or in a limited pitch range.

In order to help Michael feel safe and to promote his sensory learning, individual sessions were designed to promote playful interaction, sensory integration and enjoyment. I used music as a way of encouraging Michael to feel the different moods in music (happy music, sad music, grumpy music), to sense different rhythmic (rum-tee-dum-dum) and pitch patterns (high and low), to feel different pacing (fast and slow), and to experience the movements that could go with those musical differences. Importantly, although I modeled and encouraged Michael's exploration of music, Michael's mother was a key player in our musical games. Michael and his mother were also part of group music and movement sessions where he learned to watch others, to listen to instructions, to anticipate the structure of group activities and eventually to join in cooperative musical action songs and play.

Musical dynamics helped to introduce passion and emotional energy into Michael's play. Energy and a level of control are required to beat a drum loudly, to change from loud drumming to soft tapping and back to playing loudly. Michael turned out to love being a solo drummer and having us copy his rhythmic patterns. I also used pitch (e.g. ascend-

ing and descending scales to help him get up and down from the floor), repetition, and rhythmic, playful songs to help him to anticipate and practice sequences of an activity. Humour was extremely important and Michael responded well to the unexpected and playful quality music offers.

I created an action song for Michael about a little clown "way down low in the bottom of the box" who came out of his box to brush his hair, put on his hat and jump up and say proudly "Here I am!". Michael is learning the actions and is now able to go from a crouching position on the floor to jumping on (musical) cue to proclaim "Am!" loudly and tunelessly and then go back "Down, down, down, down, down", to the descending five note scale and wait for the repetition of the song. The lyrics of this and all the songs I use with Michael are deliberately slowed down in order to help him listen, anticipate, join in the actions and enjoy success.

Michael is so proud of his achievements. He is less anxious, better regulated, more playful and interactive. He is using words with greater clarity and more expression, and his voice is better modulated. While some of this is undoubtedly the result of the input of my colleagues, I feel confident in saying that the music has become a strong organising factor helping him to understand, anticipate and execute a sequence of actions. He is beginning to respond physically to specific musical cues such as changing direction, or to walk faster or slower. Moreover, as his mother and I echo his musical offerings by following his lead, we affirm his sense of self.

Isabella aged three years

My first meeting with Isabella was when she came to our individual music session, racing down the hallway at top speed, bursting into the music room and proceeding to leap and jump around before crashing into the piano stool. Clearly, safety was going to be an issue! She moved impulsively and found it difficult to sit still. Her play was highly energetic. She found it hard to change from one activity to another. Isabella's fine motor skills were immature and she had difficulty holding a

beater or sitting long enough to play the drum.

I began by playing music on the piano that matched her highly active movements. Then I gradually slowed the music down and watched her calm until she was able to sit on her mother's knee on the rocking chair. Her mother's slow, gentle rocking combined with my singing a gentle lilting song in triple metre continued to calm her down as well as beginning to help her learn about the structure of events. The song, "Rocking in the rocking chair on your mummy's knee", had a clear beginning, middle and end. It finished with the words "now get ready to stop!" Isabella's mother followed my musical cue and brought the rocking chair to a stop, still holding Isabella gently but firmly. Then I sang, "Do you want more rocking?" Thus the first of the song routines began.

Unlike verbal instructions that become tedious if repeated too often, a sung word or instruction can be repeated over and over through a song until the child has listened, grasped the new concept and completed the task

It was very evident from our first session that rhythm is an important physical organiser for Isabella. Helping her move or play in time with the beat of the music promoted relaxation and a sense of calm and well-being. One of the key contributions of the music intervention programme for Isabella was to use the external pulse of music to help her system to make rhythmically organised responses and to involve Isabella's mother in these physical activities as much as possible.

A rocking chair, a large physiotherapy ball and a hoop were used in each session. These became symbols of stability and calmness. After a few sessions, Isabella would go straight to the large ball and relax onto it as her mother and I rocked her slowly in time to a calming song such as "Roll, roll, roll the ball slowly on the floor, Isabella's rolling, rolling on the ball". (I sang this to the tune of "Row, Row, Row Your Boat",

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although other tunes could be used.) Later she chose to position herself in front of the big mirror so that she could watch herself being rocked and rolled on the ball.

With each session Isabella became increasingly calm and attentive. She enjoyed the use of clear, colourful, simple picture books with chants or nursery rhymes propped up at the piano as we sang together. The songs were sung slowly with reference to each character or animal in the picture book. Speech phrases were sung or played in melodic phrases that supported and tonally emphasized the natural patterns and intonations of speech. The song or chant gave opportunity for her to provide closure at the end of each phrase, to play the loud ponderous walk of an elephant on the piano, or a quick little mouse scampering up on the high notes. A turtle puppet could only walk slowly up and down when her fingers slowly playing turtle music for him to move in time!!

After six months of therapy, Isabella's movements are becoming increasingly paced and pulsed to the beat of the music, whether it is a known song, or we are creating new music together. Her drumming is becoming much more rhythmic and organised, and she is able to maintain this rhythmic play for the duration of the music. She enjoys the use of colour-coded tuned chime bars and her singing is becoming more tuneful and expressive. We play matching games as we beat and sing up (or down) the eight notes of the scale to Ba, ba, ba, ba, ba, ba, baa! She usually chuckles with delight with our final Baa.

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repeated over and over through a song until the child has listened, grasped the new concept and completed the task. Isabella is learning to listen better, and as she becomes better able to listen and follow routines, she is more affectionate and responsive to her mother and to others around her. Her mother reports that she is able to set limits and boundaries through the songs, and reports that the sung instructions are very effective in their daily routines.

Maria

When she first started in music therapy, Maria was a timid, slightly built, rather fragile looking child. She was shy and tended to whisper the words and phrases she could say. From the beginning, however, Maria was very creative musically. She offered gestures, bodily movements, and sounds, which I began simply by copying, following her lead. Following a child's lead is very important. When the music therapist creates a musical idea, or offers a musical phrase, it is an invitation for the child to respond. However, when the roles are reversed and the therapist repeats the child's motif, or extends the child's phrase, the therapist is posing musical questions. In answering those musical questions, the child communicates a sense of self, of who she is. ^[6, p.57]

Copying Maria's whisper generated a shared moment of musical empathy, and helped her discover the power of using her voice. Over the course of a number of sessions, she was gradually able to go from a whisper to the roar of a bold lion. And as her confidence grew so did her musical creativity and she began to express a range of emotions and

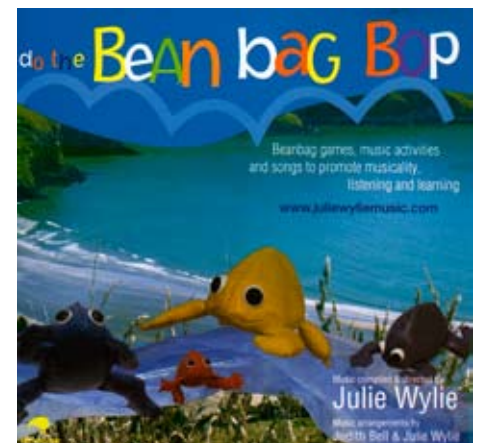
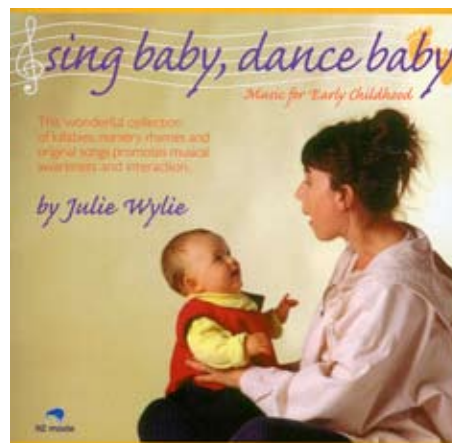
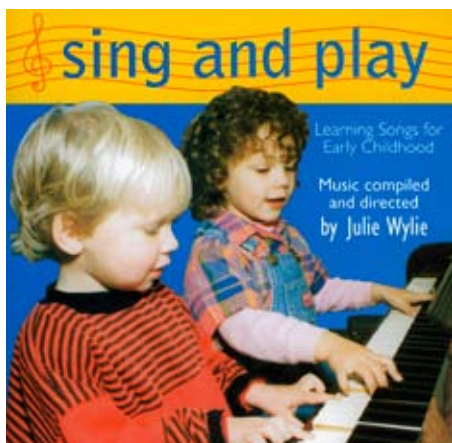
enjoyed the element of suspense, surprise and humour. One particular development occurred in relation to the drum. At first, Maria timidly tapped the drum. I then pretended that I was too nervous to play. Maria became bolder, showing me how to play. Soon we were playing the drum together with Maria copying, responding to, and offering a wide range of patterns and musical questions. Sometimes she would play a rapid pattern on the drum, then hold the beater high in the air watching and laughing as I waited for her to play her ending. Or she would offer a rhythmic pattern like a musical question and wait for me to play an answering phrase. As her musical offerings were affirmed we were able to share the joys of musical communication.

During the sessions with Maria, I introduced different story characters and puppets, and made use of a mirror. Maria developed confidence to explore different elements of her speaking voice through narrative play in front of the mirror as she played different parts, enhancing the expressive qualities of her voice. Connected to the narratives, use of pattern, tempo, dramatic pauses, repetition, and changing dynamics in a musical game are helping Maria become more tolerant of sudden, unexpected changes. Maria also enjoys dancing to music and the use of scarves, and organza fabric which is held by Maria, her mother and me as we do dances such as "Coming Round the Mountain" and other folk dances from around the world.

It is important to dance sing or play rhythmic patterns, chants and

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rhymes slowly with much use of repetition so that Maria enjoys the success of copying a pattern accurately. This can be done using the voice in a low or higher vocal range to introduce contrasting pitches and to maximize musical enjoyment. As we chant nursery rhymes or make up rhythmic vocal patterns such as Ma, Ma, da te Daa, these are then played on the drum. We create dances or finger dances to some of Maria's rhythm patterns. The rhythmic patterns used in our drumming are now very evident in the increased clarity and musicality of her speech. Her smile and confident toss of her head speak volumes about the increase in her confidence and enjoyment of musical play.

Maria is now able to listen to and follow a musical plan. She has developed a wonderful sense of rhythm, sings tunefully and enjoys playful music interaction. This is clearly evident in the group music sessions where she is enjoying being the leader as well as being part of a group. She is clearly enjoying the interactions with the other children.

Learning outcomes of music play

In a card written by a grateful parent, one mother wrote:

"Musical play has become an integral part of our family culture. Singing and musical play energises and transforms our daily routines. We have a song that can be changed to suit whatever our child is doing. It takes the stress out of routines such as meal time and bath time. We now have much more fun and have noticed that our family stress levels are lowered and our child's sense of timing is more precise when we sing him through each step of a process. David is adding words to the songs, he sings his own little babble songs as he rides his trike, plays in the sand-pit, or plays with his toys. His speech is becoming clearer especially within a chant or song when the tempo is slowed down. Music has enhanced our family life and through the use of music games we have learned the value of musical play".

Musical play includes a wide range of activities that call for passive and active responses, physical manipulation, social interaction, emotional reactions, and cognitive skills. For

children with Down Syndrome, music helps provide a sense of well-being and teaches social, motor, cognitive and conceptual skills. It offers opportunities for self-expression, self-esteem and self-control. The children develop their talents and strengths through musical play.

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