



Beating the Drum for Equality:

The Benefits of Music for Those with Developmental
Disabilities and Special Educational Needs

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We know that playing outdoor musical instruments promotes relaxation, alleviates anxiety and nurtures well-being, and music therapy has long been recognised as having a powerful therapeutic effect. Actively engaging with musical instruments has been proven to '*induce multiple responses – physiological, movement, mood, emotional, cognitive and behavioural*'¹ and there are very few other stimuli that have such a profound positive impact on such a wide range of human functions and emotions.

Studies that investigate the impact of music on adults and children with developmental delays and/or with Special Educational Needs (SEN) are growing in number and it should be no surprise that their findings suggest that playing musical instruments can have significant benefits for those living with these types of disabilities and disorders.

Benefits of Outdoor Musical Instruments

Like physical exercise, music is for all ages and for all people and leads to better health and wellbeing for those who participate. Music helps to facilitate communication because music making goes beyond words, often initiating powerful emotions in those who are involved, whether as participants or as spectators. Music can also enhance the quality of life of those who are under palliative care or beyond medical help because making and listening to music is a pleasurable activity that is easily accessible, and which brings joy to everyone, even those who are no longer able to find pleasure in other activities.

Music has also been shown to stimulate memory recall and induce positive changes in mood and emotional states. For these reasons music therapy is often used to assist with pain management² and the results of this can be very effective. Playing outdoor musical instruments specifically also promotes physical movement and whole-body engagement and so these types of instruments are often used in physiotherapy because they encourage the development of both fine and gross motor skills. The familiar sounds can also promote feelings of security in those who are resistant to change or who experience anxiety.

Outdoor musical parks such as the ones created by Percussion Play produce environments which encourage social interaction and community integration because when people see or hear the instruments being played they want to get involved and join in. People from all walks of life end up congregating in the same space to enjoy the instruments and this breaks down any social barriers which may exist. The instruments also transform the areas that they are placed in and can contribute to regeneration.

¹ Francis, David '*The Powerful Role of Music in Society*' (2010)

² Thompson, D '*Music Therapy for Pain Management*' Everyday Health Website

Benefits of Music for Improved Communication

Studies³ suggest that playing musical instruments can lead to improved communication skills for those who participate and has been proven to be particularly beneficial for those on the autistic spectrum and for those living with dementia. Improved communication can lead to improved social skills and in addition provides individuals with the means of self-expression which is sometimes missing if verbal communication is difficult or limited.

Playing musical instruments also promotes social development because people of all ages and abilities can play together, creating multi-generational interactions and facilitating enhanced community cohesion and integration. Some musical instruments are also designed to be 'pentatonic' which means that they consist of notes that can be played in any order and still sound good⁴. These complimentary sounds encourage tactile play and creativity because it is impossible to produce 'wrong' notes. The sounds of pentatonic instruments are always harmonious and so maximise the feelings of safety for people who play them. This means that people become less anxious and are more likely to engage with their peers, meaning that communication channels are opened.

The fact that the instruments produced by Percussion Play are carefully spaced out within the musical park setting also means that there is safe physical proximity between the instruments and so people who are socially anxious feel less so because their personal space is not compromised. This creates a sense of safety within the shared space which also leads to improved communication and this is especially evident in those with autism⁵ for example. When individuals who struggle with verbal communication are supported to communicate non-verbally by playing music with others there is often evidence that their verbal communication improves as a result⁶.

For those with developmental delays and/or SEN the contribution that music makes to language development and communication is particularly beneficial. Dr Kyle Pruett, clinical professor of child psychiatry at Yale School of Medicine states that "*Language competence is at the root of social competence. Musical experience strengthens the capacity to be verbally competent*"⁷.

Playing musical instruments also increases confidence⁸ in people who participate, and this results in improved self-esteem. Often people who live with developmental disabilities or who have SEN lack self-confidence and have low self-esteem as a result of their condition. When individuals enjoy success in making music they are empowered, and this can have a huge positive impact on their quality of life as they begin to appreciate that they *can* achieve, sometimes for the first time in their lives.

Benefits of Music for Individuals with Developmental Disabilities

According to MedlinePlus⁹ developmental disabilities are "*severe, long-term problems*"¹⁰ and can be both physical and mental-sometimes both. The problems are "*usually life-long and can affect everyday living*"¹¹. There are many causes of developmental disabilities including premature birth, prenatal exposure to substances, genetic or chromosome abnormalities and viral infections during pregnancy.

³ See 'Sounds and the Spectrum' white paper at www.percussionplay.com

⁴ See 'One Note to Rule Them All' white paper at www.percussionplay.com

⁵ Percussion Play's 'Duo' is an instrument which has designed specifically for those with autism

⁶ Brown, LL 'The Benefits of Music Education'

⁷ Brown, LL 'The Benefits of Music Education'

⁸ See 'Music Matters' white paper at www.percussionplay.com

⁹ MedlinePlus is the National Institute of Health's website and is produced by the National Library of Medicine (US)

¹⁰ 'Developmental Disabilities' MedlinePlus website

¹¹ *ibid*

There is not usually a cure but treatment including speech therapy, occupational therapy and physiotherapy can help to alleviate some of the symptoms and attending special education classes, learning within a special school setting and receiving psychological counselling can also help.

Because music plays an important role in enhancing human development in the early years¹², playing musical instruments has a pronounced effect on those experiencing developmental delays. Susan Hallam, Professor of Education and Music Psychology at UCL, found that active involvement in music making can “*increase self-esteem and promote the development of a range of social and transferable skills*”¹³. For those experiencing developmental disabilities, opportunities to improve the skills that they do have, and to develop new ones are to be encouraged and music has long been seen as a pathway to overcoming some of the problems that these individuals often face.

Research by the Dana Foundation¹⁴ discovered that children who received musical education improved their ability to discriminate between sounds and increased their performance in fine motor tasks. When brain imaging was carried out on the children after they had completed 15 months of weekly music lessons it was found that the networks in their brains associated with these abilities had changed¹⁵. It can be inferred from this that teenagers and adults who have limited development in these neural areas would also benefit from having regular music lessons and/or music therapy to improve their fine motor skills and auditory recognition.

Pentatonic instruments such as those produced by Percussion Play are particularly suited to those with developmental delays as the notes of the pentatonic scale all sound good together which makes it very easy to improvise and create music that is pleasing to the ear. The satisfaction that this brings means that individuals who may struggle to succeed in other areas of their life find that they can succeed with music.

Studies have also shown that vibroacoustic music reduces self-injurious behaviours and aggressive destructive behaviours that can sometimes be evident in individuals with developmental disabilities¹⁶. Vibroacoustic music is created when musical instruments produce sound vibrations and in recent times vibroacoustic therapy has become more prevalent. Vibroacoustic therapy is based on the principle that ‘*life is vibration*’¹⁷ and that because everything (including the human body) is made of matter, vibrations can be utilised to ‘*bring the body into a state of healthy resonance*’¹⁸.

The reason why this works is because our bodies are composed of about 80% water and this water is set in motion when the body is exposed to sound vibrations. The theory is that as the water is moved by the vibrations, molecules within the water begin to communicate with each other and ‘*harmony and a healthy resonance*’¹⁹ are restored in the body as a result. Some outdoor musical instruments such as Percussion Play’s ‘Tubular Bells, Colossus and Emperor Chimes create strong vibrations when played and when the player stands ‘inside’ the musical space they find that they can feel the vibrations within their body and can therefore access the powerful benefits of vibroacoustic.

The beauty of music is that in addition to helping individuals overcome some of the limitations imposed upon them by their disability, it can also make life meaningful and this is especially evident in those who suffer from poor mental health as a result of their disability. It can be incredibly challenging to live with, or care for someone who is living with a disability or disorder, and so music can provide a joyful interlude where everyone can live in the moment and create positive memories.

¹² See ‘Music Matters’ white paper at www.percussionplay.com

¹³ Susan Hallam ‘*The Power of Music*’

¹⁴ A private philanthropic organization that supports brain research

¹⁵ Brown, LL ‘*The Benefits of Music Education*’

¹⁶ Lundqvist et al ‘*Autism Spectrum Disorders*’ (2008)

¹⁷ ‘*How Does Vibroacoustic Therapy Work?*’ Vibroacoustic Therapy Website

¹⁸ *ibid*

¹⁹ *ibid*

From an evolutionary perspective, music's value revolves around its ability "to help people with cognitive dissonance²⁰" which is the intense feeling of mental discomfort that arises when a person is unable to access or express their 'true' nature. Cognitive dissonance is often experienced by those with developmental delays because there is conflict between their own understanding of their emotions and behaviours and how these are viewed by others. Often behaviours which are useful coping strategies for the individual are viewed as being socially unacceptable by wider society and this creates feelings of discord and mental discomfort which can be difficult to overcome.

Music is a medium which enables us to get 'back in touch' with our true selves and access our inner core because it appeals to primeval human nature and rhythmic drumming for example can awaken a deep instinctive response in us. By accessing our true natures in this way, we are connecting with our innate humanity and in so doing we can all reach a higher stage of self-awareness and development. For those with developmental disabilities this can help to alleviate mental distress because cognitive dissonance is eliminated in these musical encounters.

Benefits of Music for Individuals with Special Educational Needs (SEN)

Special Educational Needs (SEN) is a "legal term which describes the needs of a child who has a difficulty or disability which makes learning harder for them than for other children their age²¹." Research has identified that approximately one in five children has SEN at some point during their school years and some children have SEN throughout their time at school.

Children with SEN may present with either a wide range of problems or specific issues and the term 'SEN' covers a broad spectrum of disability and/or difficulty. For example, some children may have problems with a particular area of learning such as letters or numbers while others may have decreased social and/or behavioural skills. However, despite these difficulties in socialisation and communication faced by people with SEN there is evidence to suggest that many individuals "show a strong preference for music and are able to understand simple and complex musical emotions"²².

Carl Orff²³ believed that music was incredibly important to a young child's education²⁴ and observed that the pentatonic scale seemed to be natural to children and was evident in their playground rhymes and chants. Using music with children who have SEN or developmental disabilities is especially beneficial as music education teaches a whole range of skills and social behaviours in a natural and non-threatening way. The fact that pentatonic notes are harmonious and cannot make harsh sounds means that even those who may struggle to achieve in other areas of life can achieve in music and this reduces their feelings of isolation.

There is also a demonstrable increase in our dopamine levels when we listen to or play music²⁵. Dopamine is the chemical in our brain that is activated when we experience pleasure and it plays a vital role in our survival. Individuals with SEN often experience reduced dopamine levels²⁶ because their lives generally entail more frustrations and they are sometimes unable to access the types of sensory experiences that contribute to increased levels of dopamine. For this reason, playing musical instruments can be a powerful and very accessible way to increase these feel-good chemicals and enhance the quality of life for those who have SEN.

²⁰ Perlovsky L et al 'Mozart Effect, Cognitive Dissonance and the Pleasure of Music' (2013)

²¹ 'How to Identify SEN' BBC website

²² Molnar-Szakacs and Heaton 'Annals of the New York Academy of Sciences' (2012)

²³ Carl Orff was a German composer who developed an influential approach towards music education for children

²⁴ Pearlman, E 'The Versatile Pentatonic Scale' (2013)

²⁵ Salimpoor, Benovy et al 'Anatomically distinct dopamine release during anticipation and experience of peak emotion to music' (2011) Nature Neuroscience Volume 14 (2011)

²⁶ Mental Health Daily website 'Low Dopamine Levels: Symptoms & Adverse Reactions'

Playing musical instruments also provides a sense of achievement for people who may not often experience this feeling. Playing an instrument like the ones produced by Percussion Play presents an achievable goal and playing can be improved with practice which means that skills can easily be improved. Individuals who master even the smallest goal in music will feel pride and a sense of achievement which increases their sense of self-esteem.

Children with SEN often find it difficult to engage in school and an enjoyable subject like music can help to keep the child engaged and interested. Because the instruments produced by Percussion Play are visually varied and have different shapes and forms a child is also encouraged to engage and explore the differences between them which promotes exploration and imagination.

Benefits of Music for Individuals with Sensory Processing Disorders

A Sensory Processing Disorder is “*a condition in which the brain has trouble receiving and responding to information that comes in through the senses*”²⁷. Although sensory processing disorders are becoming more recognised as common afflictions by the medical profession they are still not currently recognised as a distinct medical condition²⁸ which makes diagnosis and accessing treatment difficult.

Common symptoms of sensory processing disorders include oversensitivity to things within the environment. Everyday sounds may be painful or overwhelming and even very light touches, for example wearing certain types of clothing, may cause discomfort. Other individuals may exhibit a lack of coordination, a lack of spatial awareness and they may find it difficult to engage in conversation or interact with others socially. Although sensory processing disorders are usually identified in childhood, they tend to be lifelong problems and so also affect adults.

Sensory processing disorders are often associated with other developmental conditions such as autism and Asperger’s and like these conditions, they also exist on a spectrum and in some cases affect one sense (like hearing or touch) and in other cases they affect multiple senses. Individuals with a sensory processing disorder can present with both over and under-responsiveness to stimuli. For example, “*the sound of a leaf blower outside the window may cause them to vomit or dive under the table. They may scream when touched. They may recoil from the textures of certain foods*”²⁹. Other children may be completely unresponsive to anything around them and fail to respond to heat or cold for example.

Because sensory processing disorder isn’t a recognised medical diagnosis currently, many families with an affected child struggle to get the support and help that they need. If help is available, the treatment will depend on the individual needs of each child, but it generally involves helping children get used to the things that they can’t tolerate and helping them to improve at activities that they find difficult³⁰. The goal of ‘sensory integration’ as the treatment is known as, is to “*challenge a child in a fun, playful way so he or she can learn to respond appropriately and function more normally*”³¹. These challenges are designed to present the child with opportunities to master skills in the areas of relating, communicating and thinking and so playing musical instruments creates the perfect environment in which to develop these skills.

Playing musical instruments, particularly those within an outdoor setting, combines sound with movement in an interactive way and supports the establishment of positive responses to stimuli. This is because children with sensory processing disorders often

²⁷ ‘Sensory Processing Disorder’ WebMD Website

²⁸ *ibid*

²⁹ *ibid*

³⁰ *ibid*

³¹ *ibid*

display 'fight or flight' reflexes to unexpected sensations. Many observers have found that with musical instruments these fight, or flight reactions are very rarely seen³². Children are generally calmer because the sensations are pleasant and anticipated and because their whole bodies are engaged in making music, they can access the music holistically which reduces fear and anxiety.

Benefits of Music for Wheelchair Users

There are many benefits to having access to outdoor musical instruments for wheelchair users. Because the instruments are already set up within the musical park they do not require assembly and no tuning is needed. This means that the instruments are easily accessible and because the musical instruments are spaced out within the setting the wheelchair user has ample space to manoeuvre. In fact, some of the outdoor musical instruments created by Percussion Play, such as the Akadinda for example, have been designed specifically to accommodate wheelchair users and those who have reduced mobility.

In addition to providing space around the instruments to navigate a wheelchair, the ergonomically designed percussion instruments can also motivate an individual with mobility problems to expand the range of their movements to attain more sounds. This encourages balance and improved spatial orientation. Because the instruments are safe and accessible they can be played with very simple movements and are specially designed to have angles that maximise the ease of play for those in wheelchairs. They do not require strenuous movements to play and so the instruments are ideal for those who are limited physically.

Benefits of Outdoor Musical Instruments for Accessibility

Outdoor musical instruments such as the ones produced by Percussion Play facilitate social interaction because they are colourful, visually stimulating and encourage spontaneity in those who play them. There are no difficult movements required to play them and they can be easily accessed by those with physical impairments. Because the beaters are attached to the instruments they can be played instantly and so there is no delayed gratification meaning that those with sensory processing disorder, developmental disabilities and SEN do not feel frustrated when making music.

Benefits of Outdoor Musical Instruments for Music Therapy

Music therapy provides a holistic way to address a range of mobility issues, illnesses and disabilities in a non-threatening way. When individuals attending music therapy sessions are encouraged to play on musical instruments in an outdoor setting there is an even greater benefit as being outside and connecting to the natural world has a multitude of additional benefits for both mental and physical health. We know that movement is particularly beneficial for healthy brain development in infancy and provides the "stimulation that the brain craves"³³ and so making music within a park setting where whole body movement is encouraged is to be encouraged.

The Power of Percussion Play

The outdoor musical instruments created by Percussion Play are diverse and accessible to everyone regardless of ability and they make perfect additions to any setting. Percussion Play's musical instruments encourage individuals with disabilities and SEN to engage meaningfully with music and music therapy and our case studies clearly demonstrate the huge positive impact

³² Hall & Case-Smith *The effect of sound-based intervention on children with sensory processing disorders and visual-motor delays* (2007)

³³ Centre of Development: Paediatric Therapies website 'Movement is key to learning'

that playing these instruments has on the individuals who have the opportunity to engage with them. Percussion Play instruments have been successfully installed in a wide range of settings all over the world and are used frequently in music therapy.

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