



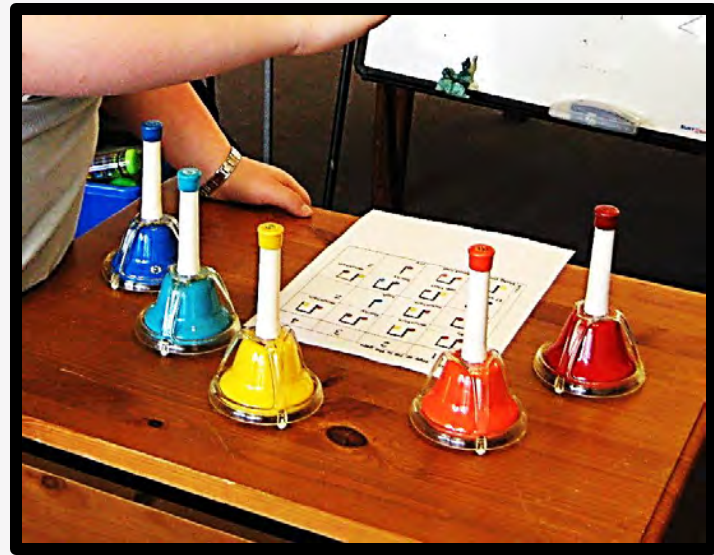
INTRODUCTION

Over the last decade, research has shown that the development of rhythmic skills in music may support and improve aspects of speech perception, even in those who have existing speech or language impairments. This poster summarises research into the rhythmic abilities of children and adults who have Down Syndrome and shows why some might have difficulties in matching movements to music. It identifies how music-making activities might be used to enhance perception of rhythm, especially in those at risk of hearing loss, and offers approaches that could be used to develop accuracy in motor-timing. Through making rhythmic movements to music it may be possible to support the same skills that are needed for speech perception, especially if these activities are practiced from an early age.

OBJECTIVES

- To identify the types of abilities children and adults with Down Syndrome might have in matching motor-movements to the beat
- To outline likely causes/contributory factors to poor motor-timing in music
- To outline how and why rhythmic motor movements may be developed to support perception and motor-timing

This woman is playing a melody on bells from simple notation, with colour-coding to show pitches



RHYTHMIC STRENGTHS

- Many people with Down Syndrome are motivated to dance and make music
- Some succeed to advanced levels in pop, rock and classical genres
- Children with Down Syndrome have a proven ability to improve rhythmic timing with instruction (Stratford and Ching, 1983)
- Visual teaching can overcome some perceptual limitations (Ringebach et al., 2006; Jeffery, 2016)
- Simplified notation is accessible and provides visual support

WEAKNESSES IN RHYTHMIC MOVEMENTS

- Inaccurate timing to the beat (Picard, 2009)
- Difficulty with some types of hand/arm movements (Stratford and Ching)

POSSIBLE CAUSES OF MOTOR TIMING DIFFICULTIES

- Reduced co-ordination, motor timing and accuracy
- Hypermobility may reduce proprioception, muscle strength, stability of joints and accuracy of movements
- Auditory Processing Difficulties: can delay or affect auditory feedback; interferes with auditory-somatosensory integration
- Hearing Impairment may cause loss of some frequencies and may reduce perception of cues; exacerbates APD (Marcell, 1995); and may interfere with auditory feedback and auditory-somatosensory integration, balance and co-ordination
- Lower Auditory-Verbal Short-Term Memory limits the ability to perceive pulse at slow tempi and some rhythm patterns (Jeffery, 2016; 2018)

WHAT ACTIVITIES TO DO AND WHY?



Encourage whole body-movement, at any age: from being rocked; to supported jumping with a partner on a trampoline; to creating dance routines, like these two men are doing

Move and be moved

For people with Down Syndrome, developing whole body movements to music, especially when young, may support developing musical perception:

- Moving in time to music influences perception of the beat (Phillips-Silver & Trainor, 2005, 2008)
- Movement activities involving the vestibular system help develop a sense of beat and rhythm, especially important for those at risk of HI (Phillips-Silver & Trainor, 2008)

Go big!

- Taiko Drums and Gamelans encourage gross-motor movements
- They can also provide feedback to the body through vibrations and strong contact



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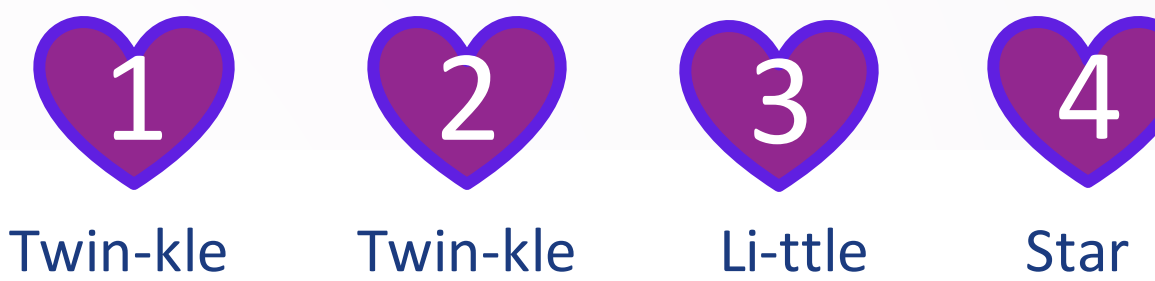
- Use scarves, parachutes, scrunchies for large movements - to see, hear, and feel the beat



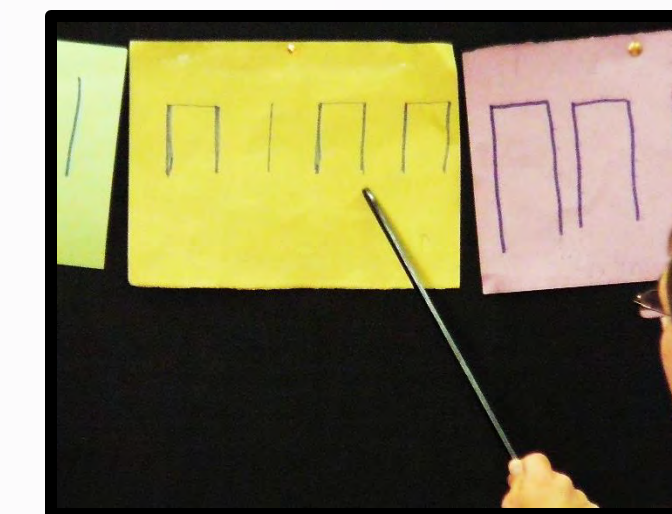
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Feel, hear and see the beat

- Walk and stomp to the beat
- Pass objects, bounce and catch balls to the beat
- Make it multisensory: tap the beat on parts of the body; show it visually – conduct using visuals, scarves etc.
- 'Think' the beat – clap or speak on the beat for 4 counts then silently tap it or 'think' it. Extend the silent phases
- Use different movements – walk, skip, jump, run, conduct, dance, clap, tap
- Draw the 'heartbeat' of a rhyme or song and use it to conduct at different tempi



This man is conducting rhythms that the group created, using simplified rhythm notation and rhythm words 'tee-tee' and 'ta'



Feel, hear, and see the rhythms

Rhythmic training can support Auditory Processing in typically-developing children and can support:

- Perception of speech sounds including in those with HI (Matsubara, Terasawa & Hiraga, 2014; Rochette, Moussard & Bigand, 2014)
- Awareness of syllables and sounds (e.g. Francois et al., 2013; Tierney, Krizman & Kraus., 2015).

Speak, step, chant and sing

- Walk or step 'long' and 'short' rhythms
- Clap the syllables of songs and rhymes
- Play word rhythms on instruments: progress from speaking the words, to clapping the words only; to speaking AND clapping/tapping
- Create rhythm poems based on words
- Use drums to 'talk' with or without words – seeing and hearing the rhythms is helpful, too
- Transform words into stick notation- see resources for more

AIM FOR ACCURACY

- Work at an optimum tempo: slow playing requires more controlled movement, longer auditory memory
- Keep rhythms and melody simple – add visual cues
- Simplify the task – focus on rhythm only; or melody only; remove words to reduce processing
- Give visual modelling and visual feedback, especially in those with HI (Welch et al., 2015)
- Work at an appropriate developmental level: ability to play pulse develops c. 3 years of age; imitation of song and rhythm develops c. 5 years

This woman is using a drum to 'talk' – she starts by tapping 'hello Tracy', then uses phrases with or without words



SUGGESTED RESOURCES

- Learning with Music: Games and Activities for the Early Years* – Frances Turnbull (2018)– includes lesson plans, songs and theory about Kodaly, Off, Dalcroze and Suzuki approaches
- Reading Rhythm Syllables, Ta Titi Ta* – Christine Hadlock (2020)- a comprehensive guide to using song and rhythm to support musicality
- Apps such as *My Little Rhythm*, *Rhythm Lock* and *Complete Rhythm Trainer* give feedback on accuracy of tapping in real time
- <https://www.soundlincs.org/resources/app-share/> - click here for apps on all aspects of music

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