

Therapeutic Function of Music

Client Background

- 28 yr male with Down syndrome
- Non-verbal: uses thumbs-up/down
- Sometimes takes multiple prompts to follow directions but eager to be involved in musical activities.
- Almost always at a high arousal and more engaged with upbeat songs and applications

Goal: Learn phrase “Come on, let’s Go”

(Chosen by speech therapist)

Essential Musical Elements

Musical Element	Theoretical Framework	Purpose	Description
<p>Pitch <i>Tones of high or low frequency</i></p>	<p>Pitch is used in speech to add stress to certain words or syllables, putting emphasis on different ideas. The pitch level at the end of a sentence also provides prosodic clues of a question or statement. (Nooteboom, 1997) People with no musical background have a harder time attending to change in pitch (). Men with Down syndrome often have a smaller range of vocal flexibility that consists of three or four whole steps in a lower range. (Lee, 2009) Low pitched voice with a breathy quality can sometimes be hard to comprehend.</p>	<p>The pitch will support the natural sound of each word in a phrase in order to develop the ability to discern vocal inflection.</p>	<p>The pitch should be within a natural and comfortable range for singing and listening (A2-G4). The pitch movement should be kept simple and at a mild pace so that the auditory brainstem can process and make proper connections.</p>
<p>Rhythm <i>A regular repeating pattern</i></p>	<p>Speech is organized with each syllable having a certain strength and duration. This helps the mental processing of the listener and can be imitated by other speakers. The accents also help to give prosodic cues. (Nooteboom, 1997) Learners who can maintain the rhythm of language sound more natural and fluent. Phonological processing is correlated to the ability to copy rhythmic patterns. ()</p>	<p>Rhythm should be used as a guide to separate words with natural spacing and to add emphasis in order to make phrases more intelligible and meaningful and thus improve the perception and production of language.</p>	<p>The rhythm should be predictable and maintain a simple structure (3/4, 4/4) Different rhythms may be allowed to encourage self-expression of the client, but the focus should be on the consistency and support of the normal speaking pattern.</p>

Essential Musical Elements Cont.

Dynamics <i>The loudness or softness of a sound</i>	Dynamics are important for audibility and emotional expression. The volume of one's speech may also be correlated with self-confidence. Speaking with a breathy quality can be harmful as it dries out the vocal folds. Increasing loudness in a song has been shown to increase the loudness of speech and improve articulation precision ().	Dynamics should encourage proper breath support and the confidence to vocalize at an appropriate volume.	The dynamics will be at a mezzo-forte level, encouraging the client to match the volume without drowning him out. The client's state of arousal and environmental noise will also be monitored and changes made accordingly.
Timbre <i>The tone color and quality of a sound</i>	Timbre is important in both speech and music perception. It allows one to identify phonemes in speech and distinguish instrument families. (Houtsma, 1997) Pairing different timbres to phonemes could be a positive aural stimulus to exaggerate the difference of certain sounds from others. Timbre is also crucial for the perception of aesthetics which keeps distraction low and engagement high.	Timbre should support other musical elements in an aesthetically pleasing way. Discriminating between different timbres (brighter vs. darker) could be used to improve the processing of speech ().	This musical element should support the basic sounds of speech and be within the client's preferred instrumentation (percussion).

Synthesis

Music can provide the positive social interaction necessary for the improvement of speech. It creates opportunity for non-obtrusive verbal and non-verbal communication. A steady **rhythm** with a strong pulse can help to strengthen motor muscle movement and provide structure for the natural timing and accents of speech. The tempo provides pacing of speech within the client's skill level. It helps all words to be kept separate from one another so that words may be recognized in a different context. The **pitch** will mimic the natural inflection of words which provides necessary prosodic information. The melody will move in mostly stepwise motion, in conjunction with the pitch, exaggerating the rise and fall of the desired phrase's tone. In this way, the melody will attempt to expand the vocal range of the client. The lyrics used will be familiar to encourage vocalization. The other use of lyrics will be the functional phrase itself, put to a melody and rhythm that resembles speech patterns. Even if the client understands and memorizes a phrase as well as has the proper motor movements, unless he is able to be heard it is not functional. Thus **dynamics** are important to increase the volume of the client's speaking voice by encouraging the client to match the volume of the instrument that is being played. Timbre is important for identifying the phonemes of speech. Different instrumentation can be used to train the client to discriminate between different speech sounds and thus improve articulation. Lastly, in all of these things repetition is important. The form of the music should be sequenced in such a way that the client has ample opportunity for repetition and thus learning of the speech.

Learn one functional phrase

MUSIC-BASED INTERVENTION PRESENTATION