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MUSIC-BASED ACTIVITIES TO PROMOTE UNDERSTANDING AND ACQUISITION OF LANGUAGE FOR CHILDREN WITH AUTISM SPECTRUM DISORDER

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Individuals with autism spectrum disorder respond positively to music. This is due, in part, to their ability to perceive and remember isolated pitches and identify the contour of melodic fragments. As well, a positive relationship exists between a child's ability to vocalize musically and the ability to speak. These observations support the use of music-based activities for students with ASD to practice and demonstrate their abilities to perceive pitch. Educational experiences through songs and singing also provide opportunities for these children to combine their perceptions of pitch, their ability to vocalize musically, and their ability to form words.

Keywords: Autism; Education; Music

AUTISM AND PITCH PERCEPTION¹

It is widely noted that individuals with autism spectrum disorder (ASD) enjoy interacting with others through music (Wan, Demain, Zipse, Norton, & Schlang, 2010). Teachers may observe that students with ASD show interest in music in many different ways. They may be excited when they see their favorite percussion instruments (e.g., hand drum), they may perform the motions that accompany actions songs (e.g., *If you're happy and you know it*), and may even join their peers in singing the lyrics of their favorite songs. This seemingly innate sensitivity to music may be attributed, in part, to the ease with which individuals with ASD are able to remember and

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discriminate tones. In this regard, Heaton, Hermelin, and Pring (1998) observed that children with ASD were more proficient at identifying and remembering isolated tones than their typically developing peers. In addition, Heaton (2003) found that children with ASD were better-able to remember and identify tones embedded within musical chords (e.g., three or more tones sounded simultaneously) than their non-autistic peers. Continuing research in a similar vein, Heaton (2005) noted that children with ASD performed better than their typically developing peers when asked to indicate whether a group of successive tones formed ascending or descending patterns.

Many children with ASD are able to produce and replicate pitch. At first vocal responses may seem involuntary but, with time and exposure to music, children find ways to communicate with others vocally through music. They may begin this process by relaying enjoyment in musical interactions by emitting verbalizations that are not readily recognizable as formal language. Over time, children may begin to reproduce the melody (or parts of the melody) of familiar songs. Through continued practice, the words that accompany the melody may become distinguishable in their vocal performances.

SINGING AND LANGUAGE DEVELOPMENT

Delays and deficits in language development are one of the defining features of ASD (American Psychiatric Association, 2013). Students with ASD display a wide range of verbal behaviors. Many individuals with ASD do not use language; some are able to use single words to communicate. Up to fifty percent of people diagnosed with autism do not acquire functional speech (Preston & Carter, 2009). Of these, atypical patterns of pitch, rhythm, and stress are common.

Research findings support the use of songs and singing to help children with ASD acquire language (Lim, 2012). Support for this approach is found in MacMillan and Saffron (2004) who highlight the similarities between these modalities. Both language and music exist in time. As well, both are

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perceived as pitch patterns that, when grouped together, transmit cultural meaning. In language, these sounds are interpreted as words; in music, tones are understood in relationship to intervals and scales. Given the similarities between language and music, it would seem that the acquisition of proficiency in one medium might influence the proficiency in the other.

Implications for education

Research findings indicate that children on the autism spectrum have a natural affinity to perceive pitch (Heaton, 2003, 2005). As well, Edgerton (1994) revealed a relationship between a child's ability to vocalize musically and the child's ability to speak. These observations support the use of music-based activities for students with ASD to practice and demonstrate their abilities to perceive pitch. In addition, educational experiences through songs and singing provide opportunities for these children to combine their perceptions of pitch, their ability to vocalize musically, and their ability to form words. The following series of activities provide examples of informed practice.

Activity 1: Slide whistle

A first step in being able to reproduce melodies is to aurally perceive the patterns created by a group of pitches. This activity provides students opportunities to practice this skill. The teacher plays patterns on a slide whistle (Kranowitz, 2003). The students create movements to demonstrate their awareness of the shapes created by these aural patterns. They might sit in chairs and create movements with their upper bodies while sitting in chairs; they might create movements with their entire bodies while standing. The tones produced by the slide whistle can be manipulated in a number of ways to produce sounds that:

- move along the entire range of the whistle from low to high or high to low;
- move quickly or slowly;
- move partway up or down the slide and suddenly stop;
- quiver swiftly back and forth.

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Once children become involved in this game they may begin to produce the contour of the pitches with their voices. This creates a bridge to the activities that follow.

Activity 2: Birds and bees

In this activity students demonstrate their ability to perceive and reproduce melodic contours created by the flight patterns of birds and bees. When first implementing this activity, the leader (usually the teacher) stands at one side of the classroom holding a toy bird or bee. The leader *flies* the bird or bee across the room and the children produce vocal sounds (e.g. hum or bzzz) to show the contour of the flight path. Once children are familiar with the activity, a child can be chosen to *fly* the bird or bee. Two-part singing is created when two children construct flight paths simultaneously and their peers decide which of the contours to follow with their voices.

Activity 3: In a hot air balloon

This activity demonstrates another way that children may demonstrate melodic contour with their voices. The teacher draws a picture of an out-of-doors perspective on a white board. This could be a cityscape with tall buildings and roads or a rural view with fields and trees. On one corner a hot air balloon is drawn. A contoured line is drawn from the balloon and across the picture. The children use their voices to create sounds that show the contour of the balloon's trajectory. Alternately, the teacher could create a hot air balloon with a basket, some strings, and balloons and then *fly* the balloons across the illustration. This could be combined with visuals from the book *Up, up, up* (Reed & Oldfield), a story about the adventures of children in a hot air balloon.

Activity 4: Songs with simple repeated texts

Teachers may guide students with limited verbal skills toward singing by encouraging them to vocalize with portions of songs. The song *Old MacDonald* is an ideal vehicle for this process as it

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contains the repeated motive E-I-E-I-O. Students are encouraged to take part in the singing in whatever way best suits each individual. Some students may create the expected vowel sounds, while other students may produce personal verbalizations that represent these sounds. This song has several verses, each following the same structure. This provides multiple opportunities for students to practice producing these vowel sounds.

Activity 5: Sing hello

In promoting language development through music education, *singing hello* is an introductory activity that encourages students to integrate language with their ability to reproduce the pitches they hear. The teacher kneels in front of a student and sings hello into a microphone (e.g., a plastic microphone purchased at a discount store). She then holds the microphone toward the student and prompts him to say hello. This may take some persistence because, in the beginning, students may demonstrate echolalic behavior (e.g., imitating what the leader has said). For example, the teacher sings *hello Jennifer* and instead of singing *Hello, Mrs. Lawrence*, the child sings *hello Jennifer*. With careful modeling over time (e.g., demonstrating how other students address the teacher), Jennifer may learn how to exchange greetings. After students are able to sing *hello*, these greetings may be extended to short conversations such as *where do you live?* (teacher's question) and *Calgary* (student's response).

Activity 6: Rhythm sticks as building blocks to speech

Rhythm in song is the pattern of sounds and silences determined by the text. Simply put, rhythm is the way the words go (Choksy, 1999). Prior to this intervention, children are able to play rhythm sticks, holding one stick stable while coordinating eye-hand movements so that the other stick taps the middle of its' partner. The teacher sings *Alberta springtime* (Figure 1) to the students on several occasions so they become familiar with the piece.

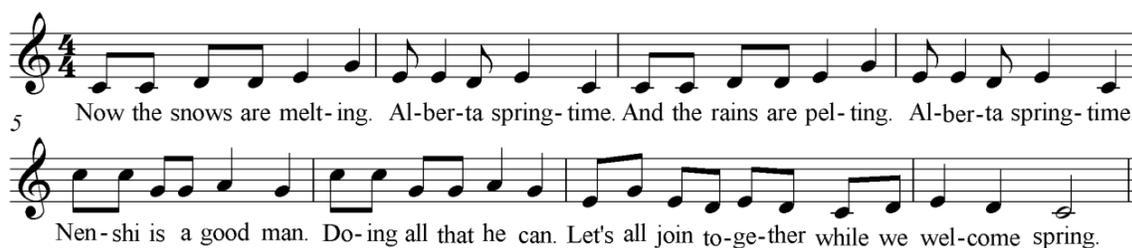


Figure 1: Alberta Springtime (Scott, 2015).

The teacher sings the song and models playing the rhythm sticks on the repeated words *Alberta springtime*. She then provides students with rhythm sticks. The teacher sings the song and students join in playing the rhythm of the words in time with these repeated sections. While the teacher might begin by playing along with the students, this assistance is removed as soon as possible so that students take ownership for their part.

Activity 7: Kazoos as building blocks to speech

After students are able to play the rhythm, they are encouraged to vocalize this pattern. One way to do this is with kazoos. The teacher may begin by modeling the song, singing most of the lyrics, but playing a kazoo for the *Al-ber-ta spring-time* motive. Students are then given kazoos. The teacher sings the lyrics and, either alone or along with the teacher, the students play this motive with their kazoos. Following this practice, the teacher encourages the students to perform this motive with the words.

SUMMARY

As I interact with teachers I realize that many of them struggle to find ways to involve students with autism spectrum disorder in their classes. They want to offer these students the best education possible, but do not know how to do so. The natural affinity students with ASD have toward music may create avenues for involving these individuals in educational experiences.

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Students with ASD display a range of verbal abilities. For those with limited verbal abilities, music-based activities offer opportunities for children to practice and display their abilities to perceive pitch, to vocalize musically, and to form words. The educational interventions described here provide examples of a range of interventions beginning with activities in which students display pitch perception through movement, to activities in which students create vocalizations to reflect aural perception and, finally, activities that link vocalizations to the formation of words.

Working with students with ASD requires that teachers carefully observe and respond to the students' reactions to their educational environments. These interventions are not a set of teaching recipes. While many of these ideas are suited to learning communities beyond my own, educators must not presume to transfer this advice to their own classrooms. Rather, they must adapt and reshape these ideas, creating environments responsive to the immediate needs of their students. I hope that the work I share helps educators on their personal journeys, creating and recreating educational contexts for their students.

Notes

¹Portions of this literature review are abbreviated from *Building bridges: Music education for children with autism spectrum disorder* (author, unpublished manuscript).

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