

## **Linking Music, Language, and Literacy: Using Research to Create an Inclusive Music Classroom Accessible to Diverse Learners**

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**Kathleen Gallagher:** Welcome to Able Assembly 2022. Linking Music, Language, and Literacy: Using Research to Create an Inclusive Music Classroom Accessible to Diverse Learners.

Our agenda today will be introductions, followed by relationships between music and reading, then Research to Classroom Translational Framework which includes: Rhythm and Timing, Pitch, and Melodic and Rhythmic Notation.

We would like to welcome everybody to our session and introduce ourselves. This is a fabulous group of people that have been working together to embody the research-to-classroom.

**Jennifer Zuk:** Hi everyone, my name is Dr. Jennifer Zuk. I'm an Assistant Professor at Boston University and a Research Consultant, with The Southport School.

I'm a Caucasian female with long auburn hair and I'm wearing a green sweater today, and I'd like to acknowledge that the territory on which Boston University stands is that of the Wampanoag and Massachuset people.

**Kathleen Gallagher:** Hello, I'm Dr. Kathleen Gallagher, I'm Head of the Lower School at The Southport School, which is an independent day school for children with language-based learning differences, such as dyslexia and ADHD.

I am a caucasian female with long brown hair and hazel eyes. I'm wearing brown glasses and a blue fleece with a school logo.

**Jessica Wyton:** Hi everyone, I'm Jessica Wyton, Music Director at The Southport School. I am a caucasian female with long brown hair and blue eyes, and today I am wearing a blue and beige shirt. I acknowledge that I am on the Pequonnock land in which The Southport School resides.

**Jennifer Zuk:** I'll start by providing a conceptual framework for links between music, language, and literacy through a brief overview of supporting evidence.

So, emerging research evidence that I've contributed to has identified ways in which musical training may inherently trained skills that are not only beneficial to music, but also relevant for

language and literacy domains. For example, evidence shows that musical training is associated with advantages in basic auditory processing, such as tone sequencing abilities as visualized in a simplified form here of recognizing low versus high pitches in music.

But actually, this translates to benefits and basic auditory processing skills that are not only beneficial for music, but also relevant for speech, such that we can think about the discrimination between individual syllables within speech as being developed through changes in pitch and timing aspects of the acoustic signal, such that we ultimately see that musical training is associated with enhanced discrimination of syllables within speech.

These benefits in the auditory domain have been shown to reflect not only the speech discrimination skills, but also be associated with the ability to manipulate individual speech sounds within words which is actually known as phonological awareness so once phonological awareness abilities play out in simple tasks, such as the example I have provided here where someone's asked to say the word "cat" without saying "k" and the resultant new word that you're left with is "at." This ability to complete phonological awareness tasks such as this, which has actually been shown to be positively associated with children's musical processing skills. Interestingly enough, phonological awareness is one of the leading predictors of a child's ultimate reading outcomes.

The idea and working framework from a research perspective suggests that it's this auditory pathway of training in the music domain that can ultimately lead to positive relationships between music and reading, which has been demonstrated in the research to date.

The ultimate working framework I've just described suggests that musical training may lead to improved basic auditory processing that can ultimately lead to improved linguistic processing, specifically in the speech and language domains, ultimately, resulting in better language skills that will ultimately benefit and improve children's reading and literacy skills.

So, this is one working framework for how we might see direct relationships between music and reading. I'll also note that emerging research evidence has started to uncover the possible role of other factors, particularly cognitive factors such as attention and higher-order cognitive skills and the executive functioning domain.

Then it may be the case that we see auditory pathways towards improved language and literacy skills through music that could also be mediated by certain cognitive skills. Bringing us from this conceptual framework from research to our translational framework that we've developed in practice, at the start of our research to classroom partnership here at The Southport School, we were curious to start by formally assessing music aptitude abilities among the students at Southport to get a sense of what these baseline musical skills looked like among our population. Interestingly enough, the majority of our students with dyslexia and/or ADHD demonstrated significantly poor performance, such that approximately 32% of children at the school scored within the first percentile on these music aptitude tests, accompanied by reading scores that were also at the first percentile.

Now, these findings are consistent with previous research documenting poor music aptitude skills among struggling readers and those with attention difficulties, and we found that these low music aptitude scores were significantly related to their reading accuracy and fluency performance.

Ultimately, this baseline assessment only further eliminated the need at The Southport School for an inclusive and accessible music education experience that could really build from this starting point in terms of baseline musical abilities.

Recognizing the need to build both music and literacy related skills among our struggling readers and children with attention difficulties, this motivated the development of a tailored music program specifically designed to be student focused, and incorporate evidence-based approaches to first design the music classroom experience to be accessible using principles of universal design for learning which you'll hear Jessica speak to momentarily.

And second, we worked to design a curriculum that would dually address children's music and reading aptitudes in the classroom. Today, I'll highlight key points from research-based evidence and Jessica will then describe her work at The Southport School translating this evidence into practice across the following three domains: Rhythm and Timing, Pitch, and Melodic and Rhythmic Notation.

So, for the first domain research has demonstrated that rhythmic and timing abilities, such as the ability to discriminate same versus different rhythmic patterns or the ability to maintain a steady beat. These skills show significant positive relationships with several speech, language, and literacy skills such as this speech discrimination and syllable discrimination tasks that I described earlier. Recognizing the ability to discriminate, for example, the simple syllable contrast between "Ga" and "Ka."

There are also several phonological awareness skills that have been intricately linked with children's rhythmic and timing skills, such as a child's ability to perceive rhymes and discriminate words that rhyme from those that don't, for example, rhyming words such as "May Day" and "Play" which do not rhyme with something like the word "Need," this classic phonological awareness task I described earlier, the ability to recognize a word and how it changes, when we take out a certain speech sound, such as saying the word cat without saying "k."

These kinds of phonological awareness tasks have also been really closely tied with children's rhythmic and timing abilities, as well as a child's ability to blend speech sounds to recognize words from its components, for example, recognizing that the sounds "c-a-t" make comprises the word "cat." A final task that's been closely linked with children's rhythmic and timing skills is syllable segmentation, such as recognizing that in the phrase "ice cream," we have two syllables: ice - cream.

**Jessica Wyton:** Building a sense of phonological awareness is at the heart of what our music program provides, in order to build the translational connection between music and language. Before I show you what I've been using in my classroom, I invite you to pause for a moment to think about how you use language in performance and in your teaching. Bringing your attention back, do you use language beyond the lyrics of the page? Let's build a musical conversation.

At this point, there's no language or visual that is given to my students. When giving a call and response, you can start with the most basic standard 4/4 time feel using whole notes, then you can decrease the duration of note values and increase their complexity. The primary goal is to start a solid understanding on phonological awareness. When one measure phrases are accurately echoed, you could then add the rhythmic solfege.

Once students are comfortable with saying *and* playing rhythmic solfege, you can shift your focus to monitoring your student's working memory and their ability to retain two-measure rhythms.

In the visual depicted on the slide, we have a 4-3-2-1 representing the note values. I call these rhythmic drills, which sounds something like this 1234, 1234, 1234, 1234, 123,123, 123, 123, 12, 12, 12, 12, 1, 1, 1, 1 OFF.

Okay, and so they would play that back, they would be audiating in their head, the rhythmic values and then you can attach the rhythmic solfeggi when they are saying it and playing it.

Another activity is an auditory, kinesthetic, and visual objective where they can mimic spoken prose through a variety of mediums like poems and short stories, with and without a metronome or a steady beat, and just having an overall feel of how rhythm plays in the words that we speak.

For a kinesthetic and visual activity, you can use manipulatives, something as simple as pieces of paper, or as depicted below the flower cutouts. You can apply rhythmic solfege, or just manipulatives maybe using small tiny erasers, or rocks, to sentences and lyrics while reading and performing. The example that I will use today is "Spring showers bring May flowers." Students can put down the flowers and the correct notation and syllabic spacing "Spring showers bring May flowers," and they can also lay out the manipulatives and tap on top of each one "Spring showers bring May flowers."

For an auditory-kinesthetic activity, students can clap syllables in speech and their responses throughout the class. Sometimes, I think my students think I'm weird because I clap out all of my sentences. But again, it's just helping them make these connections between the rhythms of our words. The example on the slide is "Hello, good morning." Students may respond with "Hello Miss Wyton, how are you?"

In this visual, we have four Lego pieces. Organized from left to right correspondence with a 4321. You'll see circles on top of each lego piece. You can have students use two fingers with

their dominant hand as they make swooping motions underneath that demonstrate how many beats you'll play the note for. For example, "1234,123,12,1," then they could add the rhythmic solfege such as "hold that whole note, ta-ah-ah, ta-ah, ta."

**Jennifer Zuk:** So, moving on from rhythmic and timing aspects, we will now cover pitch. From a research perspective, we know from the evidence that pitch discrimination skills in music, such as the ability to perceive the difference between low versus high notes as visualized in the simplified form here or depicted with more subtle differences at the frequency level on the new notation scale here that such as perceiving the difference between F and F sharp or G flat.

These basic pitch discrimination abilities have been positively linked with several speech and language specific sub-skills. Such as one's ability to discriminate syllables within speech, such as this classic example I keep bringing up of the difference between "ga" and "ka."

Pitch discrimination abilities in music have also been positively linked with one's fine grain perception of stress patterns within words and syllables, such as in the following example being able to recognize the difference in syllabic stress between the words CON-duct versus con-DUCT.

And lastly, I wanted to highlight how pitch discrimination abilities in music has also been closely linked with one's ability to discern changes in intonation in one's speaking voice in both spoken language and oral reading contexts, such as this seminal phrase that's been studied extensively by Dr. Diana Deutsch: "sometimes behave so strangely." Wherein spoken contexts, we start to perceive how there's pitch variation in one voice, over the course of a phrase or a word.

**Jessica Wyton:** When using an auditory-kinesthetic approach, you can have students stand as the pitch ascends and you can have students lower their bodies as the pitch descends. You can have students air write in ascending pitches "ooo" and descending lines "ooo."

For a tactile approach, they can depict these descending versus ascending lines by drawing something at the bottom of a paper versus the top; you can also use pipe cleaners and manipulate them to show these changing lines.

For the visual response, you can even doodle on the board or a piece of paper, and they can see the changes in rhythm and they could also see the changes in melodic pitch. Rhythm is indicated by shorter lines and smooth legato lines is indicated by these swoops. For example, if I say the sentence, "What are you doing during spring break?"

For an auditory tactile approach, you can use manipulated or fixed-pitch instruments to show changes in the intonation of words. "Spring showers bring May flowers," and now we're aligning the color-coded flower manipulatives that show the emphasis in the yellow flower there's the syllabic stress. You can have students improvise with these manipulatives and they can show you where they think that there's syllabic stresses, as they say, the sentence, "Spring showers bring May flowers."

**Jennifer Zuk:** So the final domain will cover today pertains to melodic and rhythmic notation. As I'm sure many of you can already appreciate, learning musical notation involves the acquisition of key skills that are also necessary for learning to read written text, including this sound-symbol correspondence that needs to be learned in both learning musical notation as well as learning to read written text.

Both domains also involve this natural left-to-right and row-by-row systematic visual scanning. For sure is not natural but actually needs to be trained and learned and can be learned in musical contexts in a manner that's also relevant and beneficial in natural are - sorry in classic reading contexts. And lastly, Jessica will explore the ways in which a multi-sensory approach can be employed for learning both musical notation as well as then, with skills that are relevant in the reading domain for language and written text.

**Jessica Wyton:** So you can scaffold previously learned rhythmic drills, the 4-3-2-1 I spoke about in the beginning, but you can substitute these sounds with a symbol and as depicted on the slide you see a whole pie represents a whole note, three quarters of the pie represents a dotted half note, two halves of the pie represent a half note, four quarters of the pie represent quarter notes, and four quarters of the pie represents two eighth notes on each quarter.

Students can also manipulate these, you can cut them out, and they can make up their own rhythms.

For a kinesthetic approach widely used in literacy curricula: the trace copy cover *notation* method. They can first copy you as they trace their fingers over the notes that you write. Then, they copy what they see on the paper, and then finally for working memory skills, they can close their eyes and then try to trace the notes. You notice this visual on the right, the student did not remember to color in the notes, but this is just a great way to keep track and assess their working memory and reading notation skills.

Jessica Wyton: For the flower manipulatives students can then begin to add note stems and solfege underneath. They can then see notation and see how their steady beats fall within the sentence "Spring showers bring May flowers."

Color-coded melodic notation is widely used and so helpful, you can also put colors on their instruments so that it leaves less room for decoding and just provides more accessibility.

**Jessica Wyton:** And finally, let's provide an environment to get students back to loving music, just as much as we do, thank you.

**Jennifer Zuk:** Thank you all so much for joining us today that's all the time we have but we're very excited to be able to present to you these principles of universal design infused in a curriculum that may ultimately not only provide an inclusive and accessible music classroom

setting, but also one that could perhaps support children's language and literacy development in the classroom.

For more information about this and extended references, I'd like to just point you towards our handout that we're able to provide and also highlight the references that were highlighted in today's presentation. Thank you so much, and enjoy the rest of your time at the ABLE assembly.