

Dyslexia and Music

An in-progress research study by
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Research Questions

What is dyslexia?

Does dyslexia affect music acquisition?

Are there parallels between music and language?

How could developing music skills help the dyslexic student?



Photo Credit: James Tse
<https://www.todayparent.com/family/can-music-make-your-child-smarter/>

What is dyslexia?

There is no universally accepted definition of dyslexia.

The British Dyslexia Association defines dyslexia as: “a specific difficulty in learning, in one or more of reading, spelling and written language which may be accompanied by difficulty in number work, short-term memory, sequencing, auditory and/or visual perception, and motor skills. It is particularly related to mastering and using written language—alphabetic, numeric, and musical notation. In addition, oral language is often affected to some degree” (Ganschow 1994)

The World Federation of Neurology defined dyslexia as “a disorder in children who, despite conventional classroom experience, fail to attain the language skills of reading, writing, and spelling commensurate with their intellectual abilities.” (Overy 2000)

1995 Orton Society definition of dyslexia: “a specific language-based disorder of constitutional origin characterized by difficulties in single-word decoding, usually reflecting insufficient phonological processing abilities”

Reported Difficulties Attributed to Dyslexia

The effects of dyslexia extend far beyond literacy problems.

Areas that dyslexia affects:

- Auditory skills
- Motor skills
- Spatial skills
- Visual perception
- Timing skills
- Short-term memory
- Phonological processing
- Coordination
- Concentration
- Organization
- Sequencing
- Working at speed

(MacMillan 2004)

Many people with dyslexia also exhibit:

- Erratic behavior
- Low self-esteem
- Frustration
- Exhaustion
- Anxiety
- Fear of failure

(MacMillan 2004)

People with dyslexia have difficulties with phonological processing, meaning that they have difficulties breaking up words into their component sounds or phonemes. Their problems with sound segmentation and word-blending make it very difficult to read and spell.

(Overy 2000)

What causes dyslexia?

There is no one known cause of dyslexia, but there are a few causal theories:

Theory #1: Neurological timing problems, or temporal processing problems cause deficits in various sensory, cognitive, and motor processes, which may lead to language and literacy issues.

Theory #2: Abnormal neuroanatomy of the left planum temporale region of the brain (which is involved in language processing) causes difficulties with phonological processing.

Theory #3: Cerebellar deficits cause inaccurate timing in the coordination of skill-learning, which leads to difficulties in motor skills (like automatization and balance), sequencing, concentration, coordination, and fast processing. Research suggests that the cerebellum is involved in language processing as well.

(Overy 2000)

Does dyslexia affect making music?

Through case studies, musicians with dyslexia have reported problems in the following areas:

- Reading music
- Processing speed
- Time and rhythm
- Keeping place
- Left/right distinctions
- Sequencing notes or phrases
- Fluency
- Reproducing from memory
- Concentration

(Ganschow 1994)

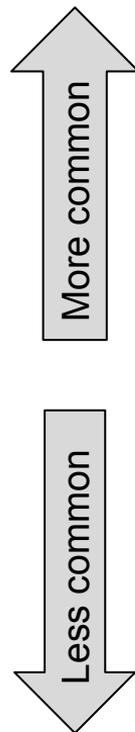


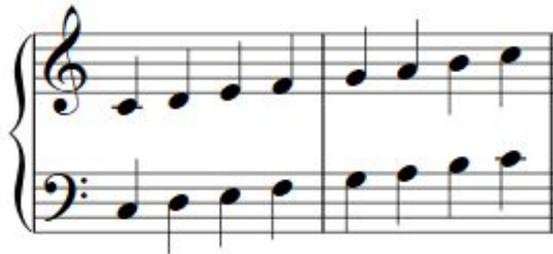
Image from:
<https://kidzmusic.com/10-ways-to-make-music-with-your-kids/>

Does dyslexia affect making music?

Musical Notation Issues:

Musical notation communicates an abundance of information and is surrounded by excessive visual material, making it especially difficult for children with dyslexia. Students with dyslexia may struggle to distinguish notes from one another on the staff. They may be able to see that the note is on a space or a line, but cannot tell *which* space or line.

(MacMillan 2004)



Timing Issues:

In Overy's study, the results showed that students with dyslexia scored higher than the control group in pitch skills, but lower than the control group on most tests of timing skills. Song rhythm was found to be an area of great difficulty. It was also discovered that the areas of greatest difficulty were in activities that involved rapid, perceptual temporal processing skills, including note detection, note number discrimination, and note order detection.

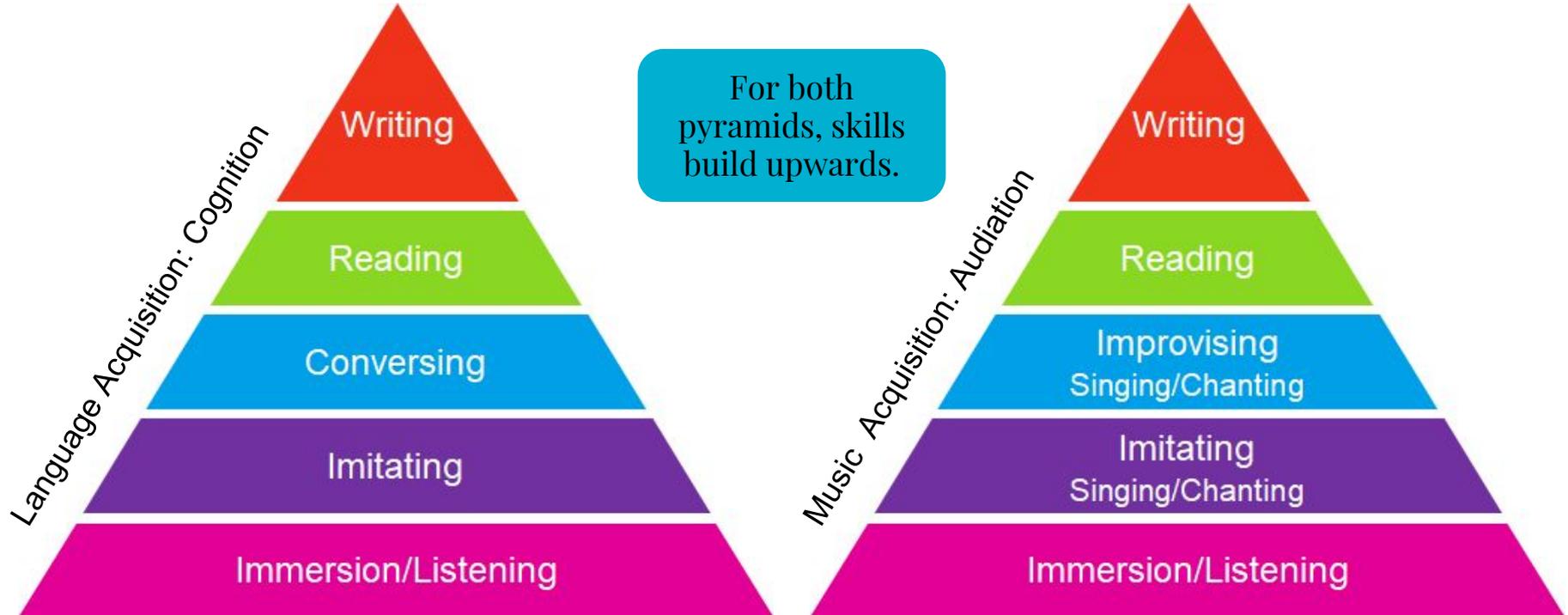
(Overy 2003)

Why may dyslexia affect making music?

Music and language require many of the same skills and functions:

- Students with dyslexia often experience most difficulties in areas controlled by the left hemisphere of the brain, which is mainly concerned with rhythm and identification of tunes. This is the part of the brain that is also used for reading skills and spelling (Oglethorpe 2008) and explains why rhythm might be more difficult than melodic reading.
- Overy said, “it appears that dyslexics’ difficulties with music may be closely connected with their language and literacy difficulties, and that all of these difficulties are based upon fundamental timing problems.” (Overy 2000)
- A correlation found between spelling ability and the skill of tapping out the rhythm of a song further supports this theory since both activities involve the skill of syllable segmentation. (Overy 2003)
- This is also evidenced by similarities between learning music and learning a language (see next slide).

A Theoretical Model for Music Learning: Parallel Between Language (Cognition) and Music Acquisition (Audiation)



Music May Benefit Students With Dyslexia

Music Teaching Methods are Well-suited for Students with Dyslexia:

- Musical training may help develop temporal processing skills, and in turn, help develop skills in language and literacy.
- Music allows for multisensory teaching by combining notation with movement, hearing, audiating, and phonating.
- People with dyslexia comprehend best holistically and through multisensory learning. (MacMillan 2004)
- The most effective teaching methods for students with dyslexia are structured, sequential, cumulative, and thorough. This is why multisensory learning is so popular. (Ganschow 1994)
- Many music lessons are designed to be flexible and accommodating to suit all students' unique needs. (Overy 2008)

Music Activities can provide purpose, confidence, and identity:

- “There are many dyslexics for whom their music lessons have been the one beacon of hope in an otherwise dark and depressing learning experience.” (Oglethorpe 2008)
- Musical activities facilitate development of social skills and self-confidence in a setting where students are comfortable, enjoying themselves, and building purposeful skills.
- Musical activities encourage creativity, participation, and confidence by allowing students to make decisions about the lesson. (Overy 2008)
- A new setting and learning focus removes the frustration of trying to develop skills through lessons centered around reading and writing.

The State of Research

Most research has been conducted through case studies and personal interviews in the following areas:

- Best methods for teaching music to students with dyslexia
- Which areas of music are most affected by having dyslexia
- If studying music can help in developing reading and writing language skills

“there is experimental evidence from psychological research, education research, and neurological research, along with anecdotal evidence from music teachers, literacy teachers, and music therapists, all indicating that music training may serve to remediate dyslexics’ language difficulties.” (Overy 2000).
Though, there is a relatively small amount of empirical research in the field of music and dyslexia.

A Research Study in Progress: Concept

Before we can know if music training can remediate language difficulties caused by dyslexia, we must first know if there is, in fact, a neurological connection between music and language.

To test this, we can ask the question:

Does dyslexia make music acquisition more difficult?

Research will be conducted this fall to begin answering this question.

A Research Study in Progress: Procedure

- Study participants: School aged children with dyslexia from partnering school.
- Length of study: at least 8 weeks
- Procedural overview:
 - Once a week, participants will participate in engaging musical activities that measure melodic and rhythmic skills.
 - The activities, or “games,” will assess skills such as: differentiating between same/different patterns, imitation/repetition, reading notation, etc.
- Data collection:
 - Qualitative and quantitative.
 - There will also be a pretest to gain understanding of student’s prior musical experience.
 - There will be 3 tests (through games) that are parallel (test similar skills).
- Analysis and Results:
 - Based on accuracy at games.

Implications of Research for Music Education

Currently, some dyslexic students hide their dyslexia in fear that professors will view them as inferior. Creating a more open discussion of the issue could help dyslexic students feel more comfortable participating in the competitive world of professional musicianship.
(Ganschow 1994)

The more we understand the ways dyslexia affects a person's musical experience, the more we can modify our instruction and assessment to be appropriate for all students.

Music may be found to be an intervention that compels students to persevere through difficulty and acquire literacy skills.
(Oglethorpe 2008)

According to the Adult Dyslexia Organization, around 15% of people have significant dyslexic difficulties. This problem is pervasive, so we should know how to best teach this population.

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