



Institute for Arts Education
and Special Needs

Learning Disabilities in Higher Education: Musical Timing Deficits and Remediation Strategies

ABLE Assembly 2022



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Welcome & Introductions

- Dr. Sara Raviotta
- Principal flutist, musician, consultant, self-help manual for musicians with dyslexia/specific learning disorder and ADHD

Agenda

- Common Learning Disabilities
- Prevalence
- How Learning Disabilities Affect Musical Timing
- Symptoms in the Core Music Classroom
- Accommodation and Remediation

Neurodevelopmental Disorders

- Affect brain function: excess or deficits in academic, social, personal, and occupational development
- Include these conditions: specific learning disorder/dyslexia; ADHD; autism spectrum disorder; developmental, social, and motor coordination disorders
- Range in severity: mild, moderate, severe, profound

Neurodevelopmental Disorders: Co-Occurrence

- High rate of co-occurrence: 85% ADHD and dyslexia and 37-85% ADHD and autism spectrum disorder
- Overlapping symptoms
- Diagnosis of one condition + an undiagnosed condition

Prevalence

- International Dyslexia Association: 20% of population has dyslexia
- Center for Disease Control (CDC): up to 13% has ADHD
- CDC: 1 in 44 has autism spectrum disorder

Introducing: Dr. Benjamin Raviotta

- Professional French horn player and university professor
- Diagnosed with ADHD at age 14
- Diagnosed with dyslexia at age 33 while working on doctoral dissertation
- Struggled in music without a dyslexia diagnosis

Musical Timing

- Musical timing = time, pulse (consistently marked time in beats per minute), and rhythm (mathematical divisions of time between 2 pulses)
- One of the most important aspects of music
- Can cause problems for students with neurodevelopmental disorders

Musical Timing: The Brain and Rhythm

- Rhythmic notation processing: occipital regions
- Perception of time and pulse and execution of rhythm: motor cortex, auditory cortex, and temporal lobes
- Working memory for storing and processing rhythm: prefrontal areas

Musical Timing: Rhythm Execution

- Involves 2 processes:
 1. Motor timing: moving your body in time
 2. Rapid temporal processing: processing sounds
- Difficulties: performing with metronome or subdividing the beat, despite hearing it; muscle control; anticipating or seeing the beat; complex rhythmic patterns; repeated notes; translation of thoughts into action
- 80 beats per minute!

Symptoms in the Music Classroom

- Mimicry rather than mastery
- Foot-tapping the rhythm rather than the pulse
- Appearing to read, but not
- Difficulty multitasking, or separating rhythm from pitches
- Untidy handwriting
- Trouble subdividing
- Anxiety, inattention, fidgeting, emotional outbursts, etc.



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Benjamin Raviotta: a personal story of ADHD and dyslexic struggles in his university's core music classes

Remediation and Accommodation

- Americans with Disabilities Act (ADA)
- Students must register with their university's office of disabilities or accessibilities
- Reasonable accommodations and services
- Even the playing field

Remediation and Accommodation: Office of Disabilities/Accessibilities

- Distraction-free testing environments
- Assistive technologies
- Alter visual content
- Help organize time and materials
- Locate and offer resources for specific deficits related to specific conditions

Remediation and Accommodation: Self-Help

- Ask for help
- Wear a vibrating, pulse metronome
- Practice in front of a mirror
- Use multi-modal practice techniques (e.g., sing and conduct)
- Visualize colors, scenes, emotions... use context

Remediation and Accommodation: Professors

- Test at 80 bpm
- Visual metronome
- Mobile devices
- Reduced ambient distractions
- Multisensory teaching
- Rhythm bank

Conclusion

- Students with neurodevelopmental disorders can overcome musical timing issues and be successful in their core music classes and beyond.
- Students need:
 - Remediation
 - Positive coping strategies
 - Access to and awareness of resources
 - Possible accommodations
 - Encouragement to find their own solutions